



GS1 Japan Handbook 2013-2014



Message from the President

Hirokazu Hayashi, GS1 Japan President



I was appointed president of GS1 Japan on July 1, 2013. I am humbled by the appointment because I am fully aware of the importance of the responsibility. At the same time, I am honored to assume the presidency in this memorable year, the 40th anniversary of GS1.

GS1 Japan joined the former EAN International in 1978, and since then it has developed along with GS1. The GS1 standard has been steadily spreading throughout Japan, with nearly 130,000 companies already assigned the GS1 Company Prefix. After thirty-five years since the start of the business, even now the number of our member firms is increasing.

Recently, GTIN, our primary identification number, is not only used at simple scanning of retail check out but used in the Internet commerce, and healthcare industries.

The use of other GS1 keys and data carriers is showing signs of expansion in Japan. For example, GLN is expected to become popular at a faster pace in parallel with Ryutsu BMS, Japanese domestic EDI message standard.

As for data carriers, GS1 Japan will actively promote the study and widespread use of the GS1 QR code as a new GS1 standard. Because of growing concerns about security and safety among consumers GTIN attribute information including expiry/best before date and batch/lot number is increasingly used in healthcare and food sector.

The use of EPC/RFID has also increased in apparel industry and asset management. We will continue to promote the solutions.

We should take the occasion of this memorable 40th anniversary of GS1 to redouble our efforts to make supply chain more efficient using the GS1 System. We hope that member companies, GS1 MOs, and the GS1 Global Office will continue to achieve further development, and we look forward to providing greater consumer satisfaction through the GS1 standards.

林 洋和

GS1 40th anniversary: message from GS1 CEO

Miguel A. Lopera, President and Chief Executive Officer of GS1



2013 is an important milestone for GS1. Forty years ago, on 3rd April 1973, industry leaders came together to select a single standard for product identification, known today as the GS1 bar code. This decision created a global language of business that until today allows visibility in the entire supply chain in multiple sectors.

Just one year later, on June 26, 1974, the first GS1 bar code was scanned for the very first time in Troy, Ohio. How could we even imagine that, forty years later, over 5 billion products would be scanned every day, all over the world?

GS1 has played a major role in shaping the landscape of the global market during the last 40 years because the organization's visionary leaders saw the huge potential of collaboration in the area of standards that the bar code made possible for the entire supply chain.

During the last four decades, GS1 identification solutions have become a foundation of business processes for over one million users. These processes allow these users to speak a common language that not only connects their companies across geographical and cultural boundaries but also allows industry leaders to leverage the power of information to improve people's lives around the globe.

GS1 is already looking ahead to its next 40 years of innovative leadership as the Global Language of Business: as consumers become empowered by the digital trend in social and mobile technologies, they increasingly require real-time product updates and the ability to scan bar codes to obtain "beyond-the-label" data, such as product origin, ingredients and manufacturing working conditions.

With this 40th Anniversary in mind, GS1 wants to look ahead to the next 40 years and build a world where things and related information move efficiently and securely for the benefit of businesses and improvement of people's lives, every day, everywhere.

A handwritten signature in blue ink that reads "Miguel A. Lopera". The signature is fluid and cursive, written on a light-colored background.

GS1 40th anniversary: message from AEON Co. Ltd

Atsunobu Agata, Vice President Information Technology of AEON



Congratulations for everyone on the 40th anniversary of the GS1.

The development of information systems in the distribution industry in the past 40 years – which has contributed much to the streamlining of supply chains – is astonishing. One of the biggest contributing factors is that the GS1 Global Office and its Member Organisations promoted international popularisation of POS systems and EDI system based on the GS1 Standards, that eventually brought innovation to distribution systems as a result.

I have co-represented GCI Japan (its former body was “GCI Study Group”, which was established in 2002, and it changed its name to “GCI Japan” in 2005) since 2005 and promoted activities to streamline/rationalise supply chains through collaboration between manufacturers/wholesalers/retailers. GS1 Japan gave us great support when GCI Japan was being established. Since then, GS1 Japan had kindly managed the administrative work of GCI Japan until 2011. We consider that GCI Japan has played a major role in the promotion of standardisation in the distribution industry in Japan while also collaborating with the Ministry of Economy, Trade and Industry for over 10 years until it ended its activities this year.

On the other hand, I myself have also been a board member of GS1 since 2011. It is an important experience for me to be able to take a part in the standardisation in global aspects in addition to local ones.

I am truly glad to have been able to share many experiences and achievements with GS1 and GS1 Japan. I would like to express my sincere wishes for your continued success and development in the next 40 years.

縣厚伸

GS1 40th ANNIVERSARY



GS1	GS1 JAPAN
1972	DSRI (Distribution Systems Research Institute) established.
1973	Supply chain information network models developed. "Distribution and Systems Review" launched.
1974	Uniform trade codes studied for each business category.
1975	
1976	
1977	Study Group for Supply Chain Information Systems established. GS1 Japan established (Previous name: DCC Japan). Allocation of common supplier codes started.
1978	Joined EAN International. EAN/UPC Symbol became Japanese Industrial Standard. Allocation of GS1 Company Prefix started.
1979	First POS pilot conducted at a supermarket in Tokyo.
1980	POS pilots conducted at AEON and Nada Coop.
1981	POS pilot conducted at a voluntary chain (SME).
1982	"DCC Japan Newsletter" published. 7-11 Japan (convenience store) introduced POS.
1983	Low-interest financing for POS introduction provided to small and medium retailers by government.
1984	Study Group for Information System in Food, Beverage, and Alcohol Industry established. Study Group for ICT-Oriented Wholesale Industry established.
1985	Ryutsu POS Database Service (RDS) Project started. JICFS (Jan Item Code File Service) Project started.
1986	Ito-Yokado (GMS) introduced POS. Sporting Goods Information System Study Group established.
1987	Barcoding in magazine Industry started. ITF symbol become Japanese Industrial Standard. Utility bills collection service system using multiple EAN-13 symbols established.
1988	EAN International General Assembly held in Tokyo. UPC Company Prefix application service started.
1989	Consumption tax introduced. Research and pilots of POS for small retailers located in shopping street.
1990	Barcoding in Book Industry started.
1991	Daiei (GMS) adopts EAN codes for all products.
1992	
1993	Heiwado (supermarket in Western Japan) adopts ITF.

1994		SCM (Shipping Carton Marking) /ASN (Advance Shipping Notice) with GS1-128 used for SCM label system guideline published.
1995	GS1 expands the use of GS1 Standards in the healthcare sector with the first Healthcare Collaboration Project.	In addition to GS1 Prefix "49", allocation of GS1 Company Prefix starting with "45" started.
1996	SC31, the International Organization for Standardization's committee for automatic identification and data capture standards, is launched, signifying international cooperation around the development and use of new standards.	Study for computerization of trade for perishables started. Open Business Network (OBN) system developed. Code-128 symbol become Japanese Industrial Standard.
1997		Japanese version of EANCOM established.
1998		
1999	The Auto-ID Centre at the Massachusetts Institute of Technology is launched, leading to the development of the Electronic Product Code (EPC). Specifications for the GS1 DataBar (a reduced space symbology) are approved.	Study and Pilot for Supply Chain Promotion for Efficient and Effective Distribution System. Allocation of GLN started.
2000	At the start of the new millennium, GS1 has presence in 90 countries.	At the start of the new millennium, GS1 Japan has allocated 88,923. GS1 Company Prefix.
2001		9-digit GS1 Company Prefix introduced.
2002	The Global Standards Management Process (GSMP) is launched, providing a global forum for GS1 members to discuss and establish new standards-based solutions for their businesses.	EAN International's Asia Pacific Regional Meeting held in Tokyo.
2003	GS1 forms EPCglobal and initiates the development of the EPCglobal architecture and standards. The GS1 DataMatrix (the first two-dimensional symbol adopted by GS1) is approved.	GEPIR operation started. EPCglobal subscription started. Japanese Industry Standard for GS1 Application Identifier established.
2004	GS1 publishes the business message standards (using XML) and the first standard for Radio Frequency Identification (Gen2). The Global Data Synchronisation Network (GDSN), a global, internet-based initiative that enables trading partners to efficiently exchange product master data, is launched.	RFID tags for ladies' shoes used at Mitsukoshi Department Store.
2005	The new name for the organisation, GS1, is launched worldwide.	Guidelines for Barcoding Pharmaceuticals with GS1 standard published. Promotion of GTIN started.
2006		GTIN adopted for online sales of music products. EPCglobal Board of Governors Meeting held in Tokyo.
2007	The World Customs Organisation and GS1 sign a Memorandum of Understanding, agreeing to support and encourage the harmonization of standards in the customs sector. GS1 enters the world of Business-to-Consumer (B2C) solutions. The aim is to provide open standards to link product information with consumers and businesses through mobile devices.	Ryutsu BMS (Japanese XML-EDI Message Standards) published. GS1 Mobile Conference held in Tokyo. GS1 DataBar Study Group launched.
2008		Guidelines for Barcoding Medical Devices with GS1 standard published. GS1 Healthcare conference held in Tokyo. Internet shopping company utilizes JICFS/IFDB.
2009		Supply Chain Standard Management & Promotion Council established. GS1 Healthcare Japan established.
2010		Pilot for utilization of GS1 Data Bar in supermarkets. Mobile Day Seminar held in Tokyo.
2011	GS1 expands its offerings with the approval of the GS1 QR Code.	Mobile Day event held in Tokyo.
2012		DSRI (Distribution Systems Research Institute) celebrates 40th anniversary. GS1 Advisory Council Meeting held in Tokyo.
2013	With presence in 111 countries, GS1 celebrates 40 years of the Global Language of Business.	GS1 Japan celebrates GS1 40th anniversary.

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1. BarCodes & Identification

1.1 Global Trade Item Number (GTIN)

1.1.1 Allocation of GS1 Company Prefix

When Japan became a member of EAN Association (now GS1) in 1978, we acquired GS1 Prefix 49 and began allocating 7-digit company prefixes to member companies. Since then, with the increase in number of member companies, an additional GS1 Prefix 45 was acquired. In January 2001, we began allocating 9-digit company prefix to companies that had less than 50,000 product items at the time of application, while allocating conventional 7-digit company prefixes to companies that had 50,000 or more items. GS1 company prefix are allocated to 128,115 companies as of March 2013. These registered companies include manufacturers of consumer products such as foods, sundry goods, apparel and textiles, and domestic electrical appliances, as well as utility companies engaged in supplying electricity, gas, water, and telecommunication services (see 1.4) and companies/individuals who sell their products online (see 1.1.3). Registration of the company prefix needs to be renewed every three years.

1.1.2 GEPIR

GEPIR, the company database for those who have registered and acquired GS1 Company Prefix, in Japanese language has been accessible since 2003 at GS1 Japan website.

Starting from 2007, the detailed location data for each GLN have been added to it and accessible as well. (see.3)

Fig. 1.1.2-1 GEPIR search result example screen

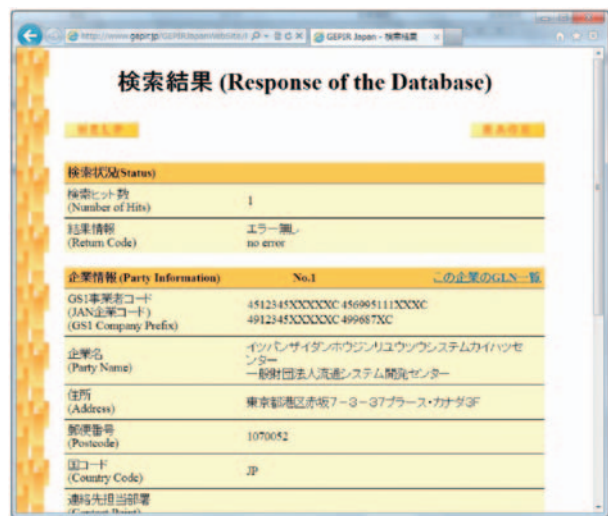
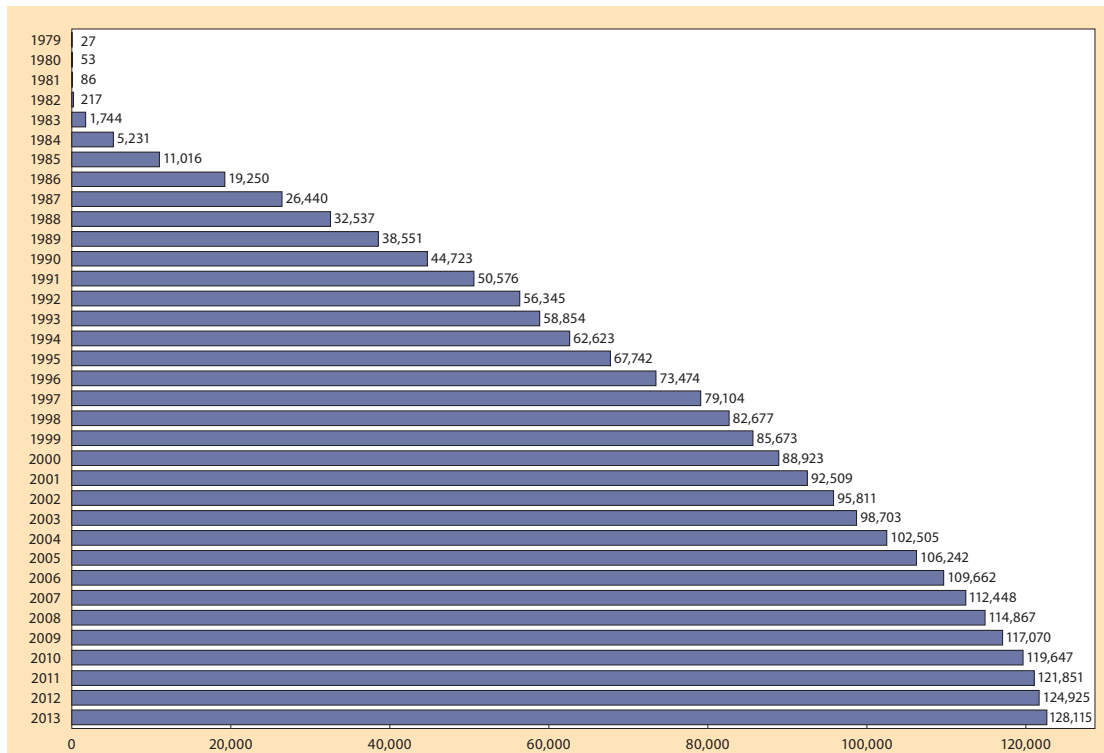


Fig. 1.1.1-1 GS1 Company Prefix allocation



1.1.3 GS1 digital (eTailer)

GTIN is now used not only for products sold in brick-and-mortar stores but also for those sold online, including both physical products and downloadable digital products.

1.1.3.1 GTIN in online music service

In 2005, a service that uses the Internet to sell music content was launched in Japan. The system called iTunes Store is run by a wholly-owned subsidiary of Apple Inc.

Since all songs must be controlled globally and digital songs must be synchronized with hard copy products of the same content, iTunes Store manages sales units (both individual songs and albums) by GTIN. Therefore, the GS1 company prefix is mandatory for registration of songs at iTunes Store.

The allocation of GTIN for digital songs should be proceeded as follows:

When the music content sold in both iTunes Store and CD/DVD are exactly same, GTIN should also be the same. When they have different content (when a promotional video is added for example), a different GTIN should be allocated.

It is certain that the music industry is becoming a great user of GTIN in Japan. Observation of newly registered GS1 Company Prefix by industry thus far shows that the registration of music categories began to increase gradually in 2004 and accounted for 7.5% in 2012.

In Japan, nearly 30 companies, including Yahoo! Japan and Sony Music Entertainment (Japan) Inc., provide music distribution services for personal computers and portable players, and several firms also provide this service for mobile phones. It is expected that online music distribution will continue to spread in Japan in the years ahead.

GS1 Japan will continue to monitor and promote the

potential of GTIN use in this field.

1.1.3.2 Use of GTIN by Amazon. co. jp®

An increasing number of online retailers are using GTIN. The following explains some examples and the potential for further promoting GTIN.

GTIN used in the “Amazon Advantage Program”

In Japan, the Advantage Program started in June 2006 for books, videos, DVDs, music CDs, software and videogames. The Advantage Program is also available in the United States, the United Kingdom, France, and Germany.

As an Advantage Program user, GS1 Japan has been selling some of its GS1 standard publications since 2007.

Amazon. co. jp® uses GTIN in its “Advantage Program”. The Advantage Program is available to small businesses including sole-proprietorships. The program can be used by small publishers and businesses who find it difficult to sell their books, CDs, or music through conventional brick-and-mortar stores.

To participate in the program a vendor needs the following:

- ★Sales rights for any items to be sold
- ★A valid ISBN or GTIN for each item
- ★A barcode on each item mapped to the valid ISBN or GTIN
- ★Access to email and the Internet
- ☆A legal address in Japan
- ☆A bank account in Japan
- ☆Be at least twenty years old and residing in Japan or a business located in Japan
- (★Requirements common to all countries, ☆Registrants to Japan only)

Amazon allocates its own Amazon Standard Item Number (ASIN), in addition to an ISBN or GTIN, and uses these numbers for merchandise management. ASIN is used because the same product is sometimes

Fig. 1.1.3.1-1 GTIN allocation procedure



1. GS1 Japan allocates GS1 Company Prefix to musicians.

2. Musicians allocate GTIN -13 to each song and apply to iTunes Store for registration with GTIN-13.

3. iTunes Store manages their database in 14-digit capacity.

sold by different vendors. This allows items with different ISBN or GTIN to be managed as the same product on the Amazon website.

ASIN is mapped to ISBN and GTIN in the Amazon.co.jp® product master data, and GTIN is used for product inspections at the fulfillment center or other distribution sites. It is therefore a prerequisite in “Amazon Advantage Program” to have ISBN or GTIN barcodes source-marked on all items.

Increasing registration of GS1 Company Prefix

For the reasons described above, an increasing number of businesses using the “Amazon Advantage Program” are applying to GS1 Japan to register their company prefixes. In the period from FY 2006 to March 2012 many new registrants of the GS1 Company Prefix always cited Amazon as their main partner. The Amazon site posts information on GS1 Japan as the contact for GTIN application. GS1 Japan continues to have close contact with Amazon.co.jp as required.

Merchandise sold on Internet shopping sites fall into two groups: (1) items sold both online and at brick-and-mortar stores and (2) items sold only online. GTIN previously had no role to play in online-only sales, but Amazon's example is significant from the perspective of expanding GTIN's potential.

GS1 Japan is a user of “Advantage Program.”

Some GS1 Japan publications are sold at Amazon.co.jp®

Search function using GTIN and cell phones

Amazon introduced a service called “Amazon Scan Search” in 2004. This service enables users to scan GTIN or ISBN barcodes from product packages using their cell phones, which in turn enables them to directly access the Amazon.co.jp page for the respective product. When customers are interested in a

product, they can search for information on it right from their cell phone and place an order right away. Mobile phones with cameras are very popular in Japan, consumers will find it easier to shop on the Internet using this service. This is expected to promote the further spread of GTIN in the area of mobile commerce.

Fig. 1.1.3.2-2 Scanning GTIN or ISBN using cell phones with camera



1.1.3.3 Shoppi: GTIN usage for multiple online shopping site

Shoppi is a free application for smartphones (iOS/Android). By reading GTIN printed on a commercial product, the application enables every user to search for and compare prices or other information on various online commerce sites. Although a number of comparison shopping services are available for online commerce and many shoppers already utilize these services, Shoppi can add two extra advantages; ease of retrieval by a simple GTIN scan and usability at any time and any place.

As of August 2013 the application supports about 40 searchable online commerce sites (about 60,000 shops) and has been downloaded 950,000 times. Both figures demonstrate that Shoppi is the most popular domestic barcode application. Most other similar applications only look up several major online commerce sites such as Rakuten and Amazon, while many specialty shops including bookshops, CD stores, toy shops and food stores are accessible via Shoppi. The number of accessible online commerce sites is one of the most important factors for application users because it may provide more search results and increase the chance of finding a cheaper product.

On the other hand, affiliated online commerce sites can expect more visitors and sales by providing merchandise information to Shoppi. For this purpose, they pay an affiliate fee and a certain percentage of the sales derived from using the application. In other

Fig. 1.1.3.2-1 GS1 Japan publications available at Amazon. co. jp®



Fig. 1.1.3.3-1 Scans GTIN



words, shops can use Shoppi as a type of online advertising.

How to get the merchandise information with GTIN

When you point your smartphone's camera at a barcode, Shoppi reads the GTIN from the barcode image. Then it uses the GTIN as search key to request the merchandise information from each online commerce site. If the GTIN and the associated information are found in the master database, the online commerce site sends back the information to Shoppi.

The price, inventory, image and other information on the product collected from the online commerce sites are displayed in a list on your smartphone. If the GTIN is not registered in the master database of an online commerce site, the site will be omitted from the list.

Affiliated online commerce sites use the GTIN for merchandise control, but the GTIN is not always registered for every article available in an online commerce site. Amazon sets codes such as GTIN and ISBN for most of their articles, while some other online commerce sites are said to have set the GTIN for not more than half of their items. Therefore, Shoppi cannot always find every article at every affiliated EC site.

Future developments

OPT Corporation operating Shoppi plans to provide a variety of services through barcode applications. For example, a scanned barcode enables one to browse related web pages that describe the details of a DVD, look for price options for game software, or find recipes for a food ingredient. Beyond comparing prices or searching for products, these services may provide more consumer-based advantages.

Fig. 1.1.3.3-2 Result for scanning GTIN



1.2 Other Identification Numbers

1.2.1 Periodical publications and books

Japanese numbering structure for periodical publications (magazines, newspapers, etc) and books is structured as follows:

The numbering structure for periodical publications (magazines) is made up of 13-digit code and add-on code. The former is made up of: 3-digit journal prefix number "491" ; 1-digit spare code "0" ; 5-digit magazine code; 2-digit volume number; 1-digit publication year; and 1-digit check digit, whereas the latter is made up of 1-digit spare code "0" , and 4-digit price.

This code structure was introduced in June 2004. Today, most weekly and monthly magazines issued in Japan are marked with this structure. GS1 Japan cooperates with Magazine Number Agency in registration and management of the code.

For books, we use two EAN-13 symbols to encode necessary data. The first one is ISBN, made up of 3-digit ISBN prefix element "978" ; 9-digit consist of 3 elements : Registration group element, Registrant element, and Publication element; and 1-digit check digit. The second one is made up of: 3-digit prefix "192" for the 2nd bar code unique for Japan; 4-digit book classification code; 5-digit price; and 1-digit check digit. GS1 Japan works together with Japan ISBN Agency in registration and management of the

number.

1.2.2 Coding for fresh food

In Japan, many agricultural cooperatives (approx. 800) get GS1 Company Prefix and allocate GTIN-13 to their products. In addition, the following coding system unique to fresh foods was developed under the government initiative with GS1 Japan's collaboration. The code structure is intended for application by shippers or in supply chain including use in retail in-store marking and ordering systems. ↗

The code is made up of: a 4-digit fresh food prefix number, "4922"; 5-digit domestic fresh food standard article code (product name number); 1-digit cultivation method classification for identifying organic farm products or hothouses, etc.; 1-digit size classification for identifying size, e.g., S, M, L; a 1-digit weight/sales unit classification for identifying sales unit, e.g., case, or volume/weight such as 100g or the number of units contained in a package; and a 1-digit check digit.

Fig. 1.2.1-1 Code structure for periodical publications (magazines, newspapers, etc)

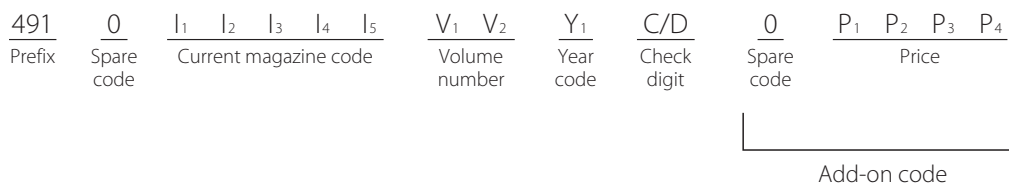


Fig. 1.2.1-2 Code structure for books

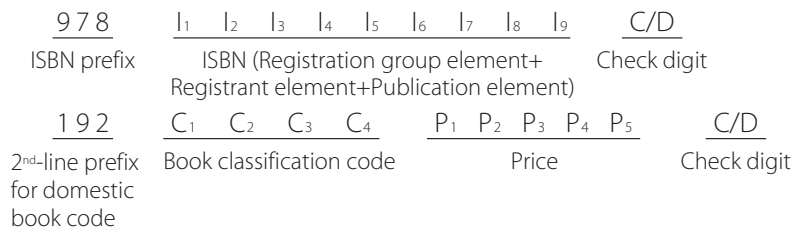
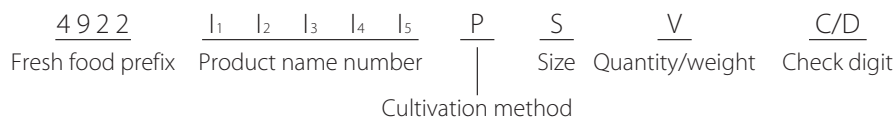


Fig. 1.2.2-1 Fresh food identification code structure



1.3 Global Location Number (GLN)

GS1 Japan has been promoting the use of Global Location Numbers (GLN) as a location code in B2B transactions. In Japan, there are currently two GLN numbering structures as shown in the table below. To further promote and encourage the wider use of GLN, GS1 Japan operates GLN database and enable GCP holders to register and update their individual location information. We provide GLN and related

details in addition to GCP holders' information via GEPIR. (See 1.1.2)

At present GLN is being used to identify companies and business locations mainly in the e-marketplaces of from department stores to wholesaler and in the EDI between the Japanese Consumers' Co-operative Union and its suppliers. We have additionally recommended the use of GLN to companies adopting the Ryutsu BMS, the Japanese EDI standard. (See 2)

In Japan, GLN has been used mainly as a basic GLN,

Table 1.3-1 GLN numbering structure in Japan

1	2	3	4	5	6	7	8	9	10	11	12	13	NO. Capacity	
M1	M2	M3	M4	M5	M6	M7	L1	L2	L3	L4	L5	C	1,000<	<100,000
M1	M2	M3	M4	M5	M6	M7	M8	M9	L1	L2	L3	C	101<	<1,000

M = GS1 Japan assigned Company Prefix

L = Location Reference assigned by Company Prefix holder

C = Check Digit

which identifies a company. With involvement of users and solution providers who develops system applications using GS1 identification systems, GS1 Japan will continue its research to encourage the use of GLNs in other context such as business offices, warehouse locations, or business functions.

1.4 Billing System Using GS1-128

A public utility charge collection service was initiated by Seven-Eleven Japan Co., Ltd. and Tokyo Electric Power Company in October 1987, after GS1 Japan at the time established a code system using EAN-13 symbols in the same year.

Subsequently, most of the Japanese convenience store chains have joined and the system has been expanded to include gas bills, telephone bills, insur-

ance fees, broadcasting fees, water bills, credit bills, mail-order bills, national pension premiums, and various tax bills. The number of bill issuers has reached a figure of 8,000 (including the service sector and public bodies), the number of convenience stores offering the service system is about 30 (over 40,000 stores), and the total collected amount exceeds JPY800 billion (USD 8 billion) / year in 2008. In 2013, the turnover from processing public utility payments collected at Japan's three largest convenience store chains (Seven-Eleven Japan, Lawson Japan, and FamilyMart) exceeded their turnover from merchandise sales, and the resultant increase in customer visits to the stores also contributed to greater sales. The initial system used 3 or 4 EAN-13 barcodes to encode the necessary information. To enable operation ease and efficiency, new system using single GS1-128 barcode was introduced in May 2001.

Fig. 1.4-1 Sample payment slip

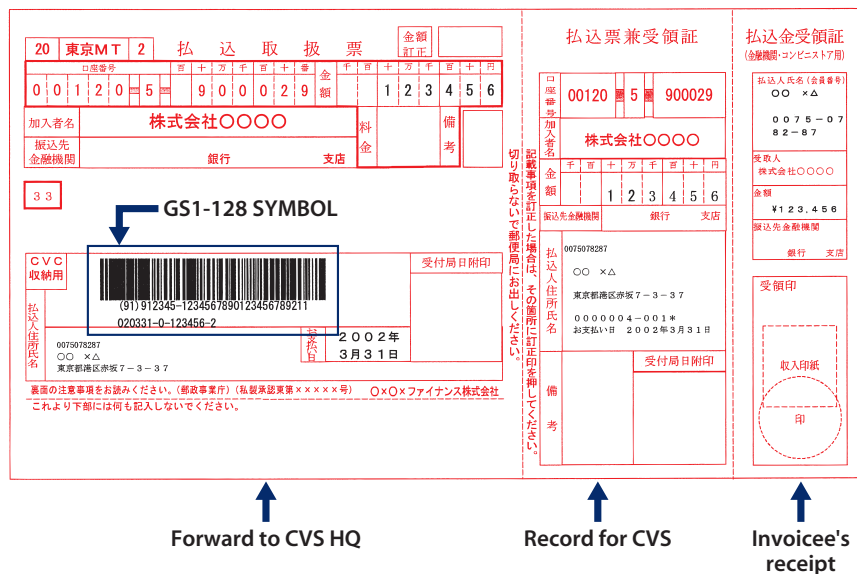


Fig. 1.4-2 Code structure (44 digits) for payment slip

	(91)	MMMMMM	EEEEEEEEEEEEEEEEEEEE	R	YYMMDD	F	PPPPPP	T
	①	②	③	④	⑤	⑥	⑦	⑧
	Data item		Content					Number of Digits
①	(91)	AI (for data item)					2	
②	MMMMMM	Second digit of company prefix (9 or 5) + company prefix (five digits)					6	
③	E...E (21digits)	free use					21	
④	R	Re-issue (times of re-issuance)					1	
⑤	YYMMDD	Payment Due date					6	
⑥	F	Postal tax indicator flag (0=not required, 1=necessary)					1	
⑦	PPPPPP	Amount due (in Yen)					6	
⑧	T	Check digit (modulus 10)					1	

1.5 Food Traceability

Recently, the food industry has been facing higher demand for food safety as well as fiercer competition. Consequently, it is increasingly required to understand and provide an unprecedented high level of detailed information about food products. Some companies and industries have responded by implementing food safety and traceability systems and building an operational systems using GS1 system. Here we will introduce some case examples of a traceability system that records transaction data for individual ID numbers mainly of beef using GS1-128 barcodes and GS1 keys and a food safety and traceability system that describes GTIN and relevant attributes (AIs) using GS1-128 or QR code in the processed food industry. For detail about QR code, please see 1.7 QR code.

1.5.1 Beef

After the outbreak of the BSE(Bovine Spongiform Encephalopathy) scare in 2001, securing the traceability of beef produced in Japan became a pressing issue. When the Beef Traceability Law took effect on December 1 2003, the traceability of domestically raised cattle was mandated. The traceability system encompasses supply chain businesses such as producers, slaughterhouse operators, packers, distributors and retailers.

Today, every one of more than 4 million cattle raised in Japan (cattle born in or imported live into Japan) is assigned a 10-digit individual cattle ID number by the National Livestock Improvement Center, a government affiliated organization that manages the national cattle database. Each beef cow wears two ear tags

marked with this ID number. Information on each beef cow including the gender, breed, date of birth, feeder's name, date of slaughter, is recorded and stored in the database.

When meat packers distribute their product (meat parts or sub-prime cuts) to wholesalers or retailers, they must include the cattle ID number on distribution label on the carton or shrink-wrapped package.

The 10-digit cattle ID number is encoded in a GS1-128 barcode using AI (251) together with other information keys including GTIN (assigned by the packers), weight, production date, carton ID, and lot number.

It is mandatory to display either the cattle ID number or lot number on a meat package sold to consumers at retail establishments. Most retailers display the cattle ID on the meat label. Retailers produce consumer package labels that state the cattle ID number in human readable numeric format captured from the barcode on the distribution label.

Consumers can trace information about the beef they have purchased using this ID number as a key on the website of the National Livestock Improvement Center. Some consumer package labels carry a 2D QR code prepared for reading by mobile phone users that contains a hyperlink to the national database website. This gives consumers an alternative way to access information about beef cattle, as the QR code can be read and decoded using many types of mobile phones sold in Japan.

The law also covers restaurants that specialize in beef dishes, such as sukiyaki, steak, and barbecue restaurants. These restaurants are required to clearly display the cattle ID or lot number of the beef used in the dishes served to customers.

Before the BSE issue arose in Japan, a standardized

Fig. 1.5.1-1 Japanese beef traceability system

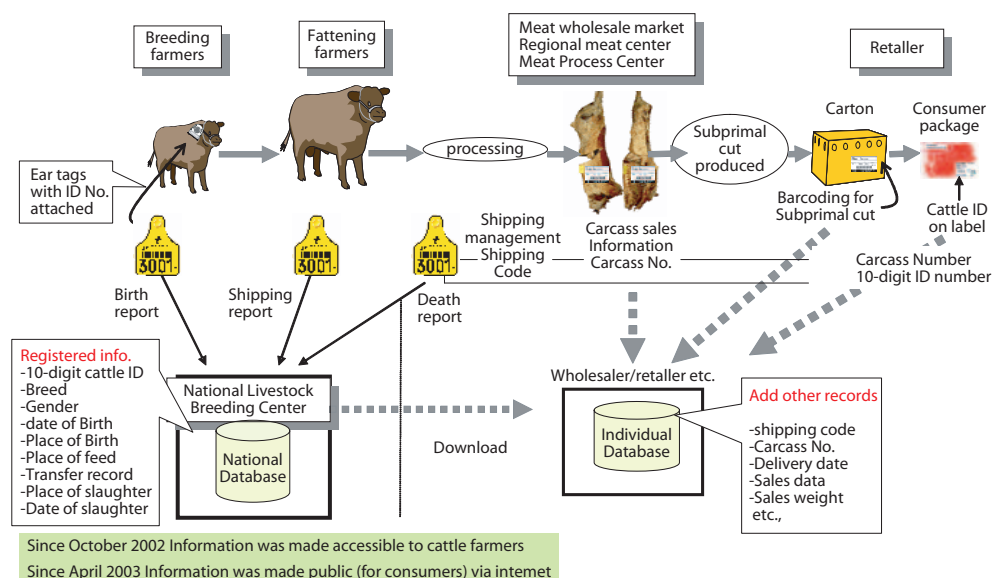
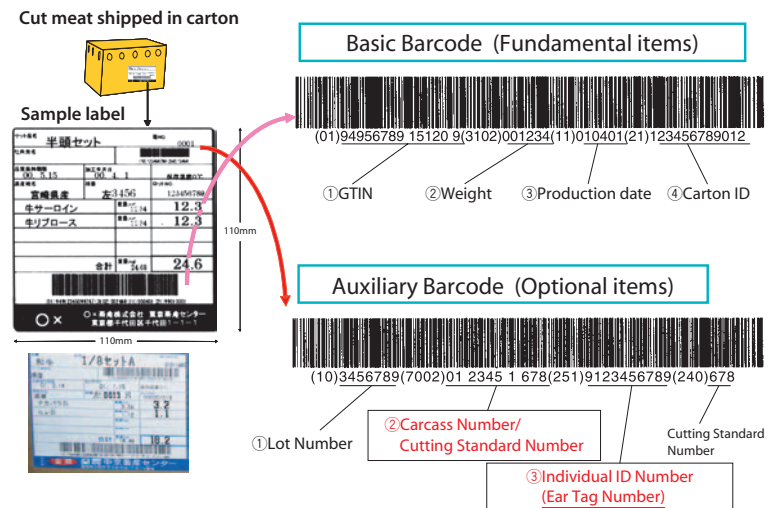


Fig. 1.5.1-2 Ear tag



Fig. 1.5.1-3 Standard physical distribution barcode label system for meat



GS1-128 data format used as a distribution label for meat products (shown Fig. 4.2.1-3) had already been in place through a voluntary initiative in the meat packing industry. After the regulatory requirement took effect, the Cattle ID number was incorporated into the label later.

1.5.2 Pork and poultry

A compulsory law like the Beef Traceability Law does not exist for pork and poultry. However, in spring of 2007, the meat industry introduced the GS1 Standard System for pork and Poultry and uses it in a similar way to the Beef Traceability Law to prevent transmission of infectious diseases to consumers and avoid the loss of sales opportunity.

1.5.3 Processed food

One of the features of processed food manufacturers is the preparation of many raw materials, various manufacturing processes, and high-mix, low-volume production. For example, Kewpie Corporation, which produces processed foods such as mayonnaise and dressings, deals with approximately 800 kinds of raw materials and packaging materials. Also, the product attributes of these foods require tight safety controls, and employees are required to confirm safety procedures in various ways. Moreover, demands and responsibilities regarding safety and security have recently increased, such as the introduction of HACCP, establishment of traceability, response to allergen description labeling, and increased items of information to provide in product specifications. For example, Tsukishima Foods Industry Co., Ltd., which deals with raw materials including margarine, shortening, and purity lard, has increased its number of employees engaged in quality control and assurance 20 times in 20 years.

Processed food and food material manufacturers urgently need to implement systems to respond to the above-mentioned business environment. Here we will introduce case examples of food safety and traceability systems using GS1 AIs encoded in GS1-128 or QR code.

1.5.3.1 System outline

Processed foods are manufactured by combining various raw materials. It is critical to prevent raw material combination errors and the use of expired raw materials. For this reason, GS1 Japan published traceability guidelines for material and processed food manufacturers. When manufactures receive and stock materials, they produce a label with a GS1-128 or QR code carrying information of the material according to the guidelines. The material name, manufactured date, expiry date, lot number, etc. are encoded using AI. When combining materials, workers can prevent raw material combination errors and the use of expired raw materials by scanning this barcode with a hand scanner. Storing work records scanned with a hand scanner enables traceability. In addition, since actual inventories including the expiry date, lot number, etc. can be identified using the data, it is possible to achieve proper inventory levels and reduce costs.

1.5.3.2 Adoption in the supply chain upstream

This system was originally used by manufacturers on a voluntary basis by attaching barcodes to stocked products to prevent combination errors in their own factories. Later, barcodes were also attached to shipping products not only to prevent combination errors but also to be used for traceability purposes. At the same time, companies have widely encouraged their suppliers to print the barcode on products to be delivered according to the same rules so that they

Fig. 1.5.3.1-1 Operation changes

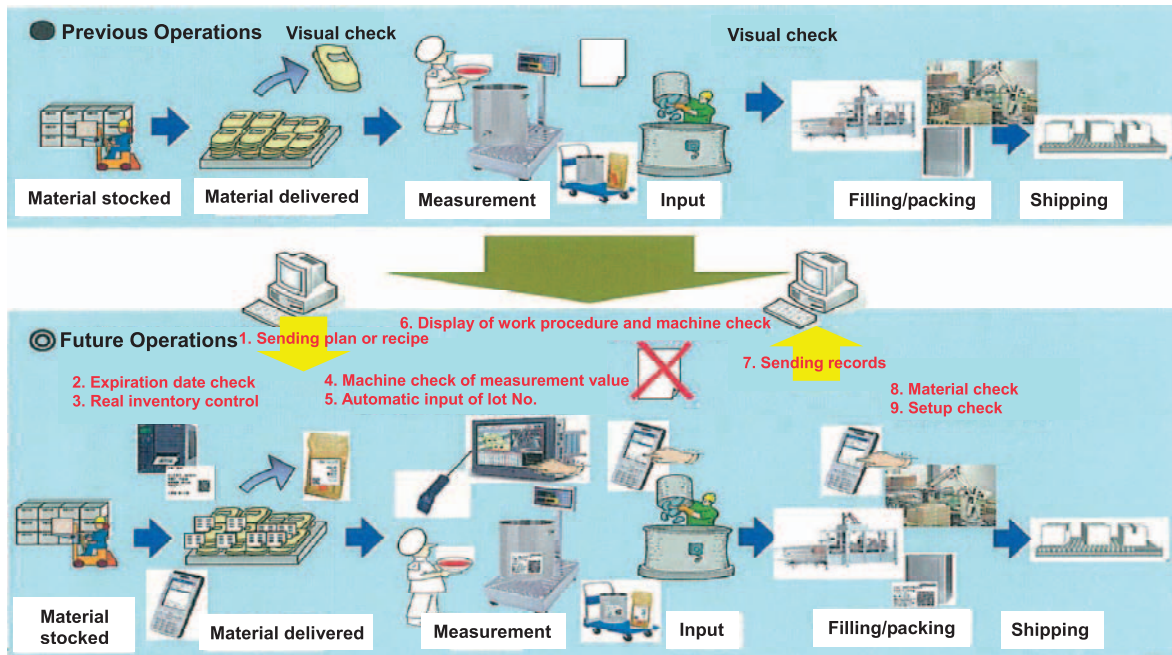


Fig. 1.5.3.1-2 Encoded information



- GTIN : AI (01)
- Production Date : AI (11)
- Expiry Date : AI (17)
- Lot Number : AI (10)

would not have to produce and to attach barcodes to other companies' products. As a result, this information display system has now been used extensively not only by manufacturers of end products but also in the supply chain upstream. In other words, food safety and traceability systems limited to a single company's internal procedure have been developing into a food safety and traceability system for the entire supply chain in a broad sense.

For example, the processed food manufacturer Kewpie Corporation requires suppliers that deliver materials to the company to print the barcode on products according to the same rules. The numbers vary by factory, but approximately 30 to 50 percent of suppliers deliver products to which QR codes including GTIN and relevant attributes are attached as requested by the company. The raw material manufacturer Tsukishima Foods Industry Co., Ltd. has decided to implement the system requested by the company to which it delivers materials. As a result, Tsukishima has worked toward implementing food safety improvements and cost reductions, as well as establishing traceability in a supply chain made up of several companies, by shipping materials with labels carrying QR codes including GTIN and relevant attributes. Tsukishima has also encouraged its own

suppliers to implement the system and it has been used extensively further upstream in the supply chain. GS1 Japan is planning to update the guideline to expand the scope of food traceability and improve its quality to show the usage of GS1 standards in the supply chain upstream.

1.6 GS1 DataBar

Since 2006 GS1 DataBar Adoption Plan Announcement, GS1 Japan has been promoting the symbol in the Japanese market. GS1 DataBar attracts attention because of its capability to carry additional data other than product identification. A nation-wide readiness is still yet to come because of various challenges, thus continued efforts and communication with the retail industry will be necessary.

GS1 Japan has organized the local GS1 DataBar Task Force involving several retailers, manufacturers and wholesalers. The Task Force is supported by a technical advisory team comprising major solution providers. Together with the Task Force, GS1 Japan has developed a local guideline to help users understand the GS1 DataBar and the potential business benefits derived from the use of these symbols. The document was published in March 2011. The guideline will be updated continuously with new business cases and implementation example.

1.6.1 Expectations and challenges in Japan

The GS1 DataBar is perceived as a new tool that will help improve product management especially in the

Fig. 1.6-1 GS1 DataBar guideline

1-2. 一般消費財(POS)用のGS1データバー
 (1) GS1データバーの種類(POS用4種類)と特徴



food chain industry. However, the symbol's ability to enable unique global identification of products such as fresh produce or variable measure fresh food is appreciated less in Japan than in other regions. Japan's domestic fresh food supply chain and its business practices are complex, and this poses an obstacle to immediate migration from the restricted circulation number (RCN) to GTIN on fresh produce. The large number of small growers and Japan's public market auction system for fresh produce and seafood make source-identification seem less valuable or a less pressing issue.

The pace of readiness and replacement by those on the accepting side is another challenge. Japan has a large number of small and medium retail chain as well as wholesalers. It makes education and promotion an important and challenging task. Even after bigger businesses are won over, smaller players tend to use their equipment longer and do not rush to replace it.

1.6.2 Promoting the value of using the GS1 Application Identifier

Retailers in Japan are currently handling additional data at point-of-sale such as price markdowns or sell-by-dates. But the data format and the data carrier are not standardized. Typically the data carriers used are Code-128 without the GS1 Application Identifier or second EAN-13 symbols made to work with omnidirectional, fixed POS scanners to process additional data. Because these data carriers are used for limited data lengths (usually 22 to 26 digits) and exclusively in-store, GS1 Japan is promoting that the importance and benefit of the GS1 DataBar lies in standardized data strings and in its possibility for expanded data as well as use in open supply chains.

GS1 Japan focuses on educating the retail industry on the value of using a common data set in a standardized way with the GS1 Application Identifier. The guideline published in March 2011 introduces the GS1 Application Identifier from the basics, including examples of use cases or pilot cases for POS in other

Fig. 1.6-2 GS1 DataBar guideline-use case in retailer

Automatic discount for short shelf life products using GS1 DataBar Expanded

1. GS1 DataBar Expanded with expiry date/hour data is attached
2. Configure the store system to check the number of date to the expiry date and discount rate accordingly.
3. Place the sticker on the package that came in to the discount period to let the consumer know

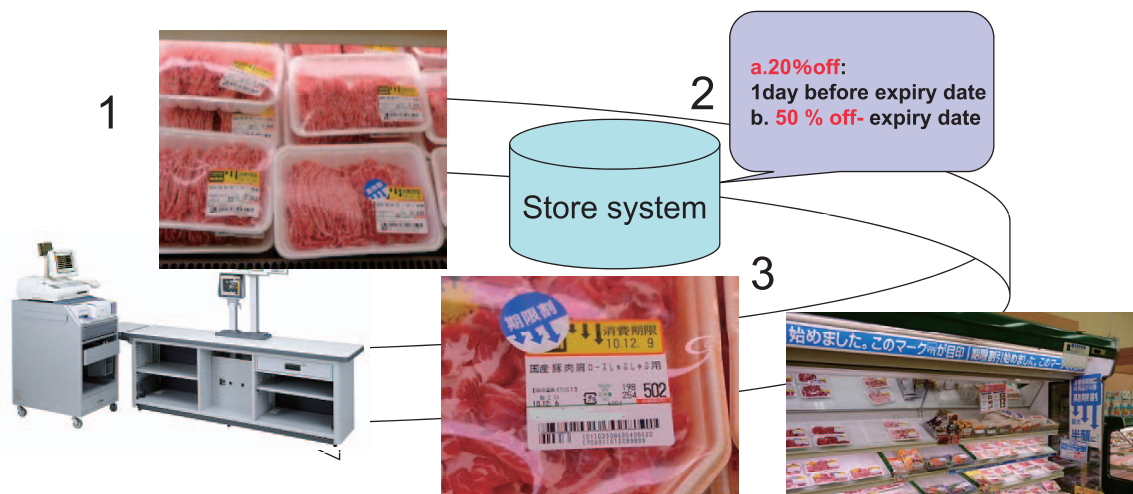


Fig. 1.6.3-1 Panel promoting GS1 DataBar use in Retail Technology Show



countries, and encourages the use of the GS1 Application Identifier for additional data, even if some of the data are only for in-store use.

1.6.3 Promoting the guideline and driving broader awareness

GS1 Japan produced a video showcasing the business benefit of using GS1 DataBar as well as Application Identifiers in 2011. The video is used in barcode education courses to promote better understanding about the symbol. We also use all the occasions including industry exhibitions and seminars by related business associations to promote the use of additional data and GS1 DataBar.

1.7 QR Code

QR code is pervasively used in Japan. It is regarded as the "Mobile barcode" because of the wide use in mobile application. It is also associated with traceability because of various use cases.

1.7.1 QR code introduction

QR codes are widely used in Japan and throughout Asia. It was invented in 1994 by Denso (now Denso Wave), one of Toyota Motor Corporation's group companies. It was approved as an ISO international standard symbol (ISO/IEC 18004) in June 2000. This two-dimensional symbol was initially created for improving production control procedure of automotive parts. After the specification was made publicly available, QR code became very well-known and widely used. In fact, it is considered to be "the 2D Symbol" in Japan.

Today's widespread use of QR codes is due to the incorporation of a bar reader for QR codes in mobile phones with cameras in the early days of mobile communication. The most popular use of QR code in Japan is to encode URL of a mobile website. More than 90% mobile phones in Japan feature a camera

with software that can read and decode information contained in a QR code, which has literally made the symbol ubiquitous in Japanese daily life. Now it is almost the norm for mobile phones to also have software that generates QR codes for any given data. QR codes are not only visible everywhere and every day in Japan, but they are also scanned (and sometimes generated) by consumers. (see 4.2 for Mobile Applications).

The use of QR codes in the mobile industry is not limited to carrying mobile URLs. QR codes also carry a variety of data including information on tickets, payments, and coupons. Such uses are rapidly increasing. Japan's major airline carriers are using QR codes for encoding boarding ticket information. Some railway companies and many on-line ticket service providers are using QR codes for tickets and admission tokens. There are retailers and food service companies who encode mobile coupon data in QR codes. In such cases the QR codes are either printed on paper or displayed on a customer's mobile phone screen are read with image readers. The use of QR codes will only increase in the future steadily, if not phenomenally. Another important use of QR codes is for traceability in food and other product supply chains. An increasing number of upstream suppliers of processed food use QR codes by encoding GS1 Data defined by Application Identifier standards (see 1.5). Government

Fig. 1.7.1-1 QR code on foods



Fig. 1.7.1-2 Example of QR code



Fig. 1.8-1 Example of a GS1 QR code



www.dsri.jp/4912345000156

◆What is the GS1 QR code?

The GS1 QR code is a subset of ISO/IEC 18004: QR Code 2005. The data is encoded in the GS1 Standard way using FNC1 mode and the GS1 Application Identifier data format. The use of GS1 QR codes is currently limited to the Extended Packaging application.

◆Benefits of GS1 Extended Packaging

1. Advantages of displaying a combination of a GTIN and URL

①Allowing the consumer to quickly and directly access to the detailed information or service web page for the product itself.

This saves consumers the time and the number of “clicks” to reach the intended information/services compared to be led to the top page of

organizations recommending traceability acknowledge the QR code as an optional data carrier for implementing a traceability system. QR codes are typically used in labels too small to carry GS1-128. The industry guideline for surgical steel instruments allows QR code as a standard symbol together with GS1 DataMatrix to carry GTIN and serial number.

1.8 GS1 Extended Packaging Application and GS1 QR Code

In 2012, GS1 standardized a new application called Extended Packaging for the brand owners to provide information or service about a product to consumers using mobile devices. For this application, the GS1 QR Code is added as an option to encode the standardized data strings. Brand owners can use either GS1 QR Code or GS1 DataMatrix to encode GTIN and the URL to which the consumers access to obtain product information.

On a product package, a GS1 QR code/or GS1 DataMatrix encoding the GTIN and a URL can be displayed in addition to the EAN/UPC symbol for the supply chain use including Point-of-Sale.

Fig. 1.8-2 Example of product website

Sample: Product Information Website

GS1 Extra Creamy Corn Soup



GTIN: 4912345000057

Product Name: GS1 Extra Creamy Corn Soup

Ingredients:

Vegetables (sweet corn, potato, onion, carrot), starch, sugar, dextrin, salt, whey powder, butter, chicken extracts,

Place of production of main ingredients:

Sweet Corn / Oregon, USA, and Hokkaido, Japan

Nutrition: per 200cc cup

Energy: 78cal, Protein 1.1g, Fat: 1.6g, Carbohydrate: 13g, Sodium: 460mg, calcium 37mg



www.dsri.jp/sp/recipe

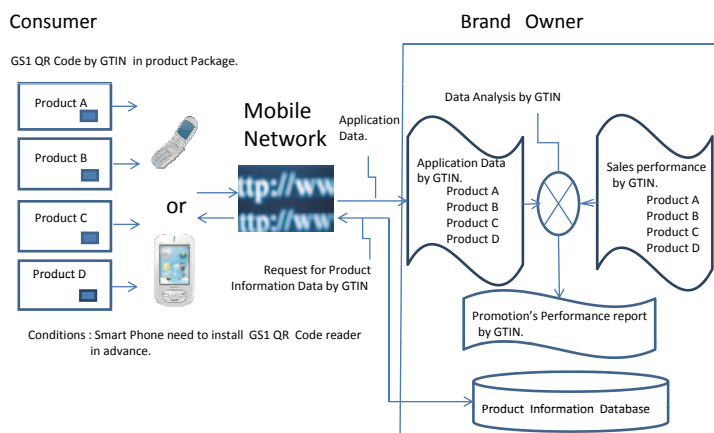
Allergen: Wheat, milk, Soy, Chicken

FAQ on the product

Produced at: GS1 Hokkaido Soup plant

www.dsri.jp/104912345000057

Fig. 1.8-3 Example of GS1 Extended Packaging application



product brand or company.

- ② Allowing the brand owners to run promotion/marketing campaign easily and effectively.

Having a URL with GTIN as an entry point to campaigns enables brand owners to collect more information about the relationship of each product and participants to the campaign. Information including what product did this consumer buy and his/her personal information such as age, gender or the region/city of residence can be collected and sorted out with relative ease. This will give brand owners a tremendous advantage for marketing and merchandising.

2. Allowing the brand owners to be effective marketing research

Since GTIN and standardized data strings are used, linkage with other systems and databases is possible. For example, the company collects applicants' data with GTIN, they can match this data with their sales data from POS.

3. Possibility to encode more detailed product attribute data in addition to URL with GTIN

Where brand owners see it suitable, they could add the data such as lot number, serial number etc. to encode in an Extended Packaging symbol. This will allow them to provide more granular information or services to the consumer.

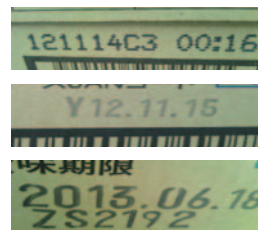
1.9 Technical Research : Direct Printing of Barcodes with Variable Information on Cardboard Boxes

In 2012, GS1 Japan conducted a study on the current level of inkjet technology to print barcodes with variable information directly onto cardboard boxes.

In the Japanese Consumer Packaged Goods (CPG) and grocery sectors, many distribution centers of wholesale businesses manually enter dates (text information) printed on cardboard boxes for the purpose of location management and shipment control based on the freshness date. Since businesses in these sectors desired very much to automate this process, the introduction of a barcode system is being considered. In the healthcare sector, the GS1-128 barcode printed on a label is already used on individual cardboard boxes. On the other hand, many CPG businesses argue that printing barcodes on labels is too costly. This is because, compared with regulated healthcare trade items, the unit prices of CPG merchandise are too low to allow for the expense required for printing. For these reasons, to evaluate the present situation of

inkjet direct printing of barcodes on cardboard boxes, we printed codes under various conditions and reviewed the results.

Fig. 1.9-1 Date and other information in text on corrugated boxes (examples)



1.9.1 Direct printing and barcode verification

Thanks to the cooperation of printer manufacturers, we used five (5) models of commercially available high-resolution inkjet printers capable of barcode printing.

We varied a number of parameters such as the material of the cardboard boxes, transfer speed during printing, codes to be printed and their content (data for the barcode, minimum bar width, etc.) to verify the quality of each barcode.

Material of cardboard box and transfer speed during printing

Three types of box material (ordinary liner, white liner, and white solid) were selected for printing. Liner means the paper that forms the outermost face of the cardboard box, and the ordinary liner is a standard (i.e., brown color) cardboard box. The white liner is a white cardboard box made of sheets that are originally white in color. The white solid is an ordinary brown liner with a white background portion that is printed with white ink using flexographic printing.

Also, for comparison, we used two transfer speeds; 30 m/min., which is assumed to be the most frequently used speed in actual packaging lines at processed food manufacturers, and 40 m/min., a slightly faster speed than that used at actual sites.

Results of printing and analysis

From the results of this technical verification of printing, we conclude the following.

The biggest challenge for inkjet direct printing on cardboard boxes is some degradation in the symbol contrast depending on the color of the box material and ink absorption in the barcode area. More than 90% of the white liners were evaluated as Grade C and a printing quality of Grade C or higher can be expected for this white material. On the other hand, the ordinary liner provided poor contrast and more

Fig. 1.9.1-1 Various parameters of test printing

Content/Condition	Description
Type of barcode	① GS1-128 ② GS1 data bar, expanded (one stage) ③ GS1 data bar, expanded and multilayer (two stages)
Data content	① GTIN+freshness date → AI (01)+(15) 24 digits ② GTIN+Date+Lot → AI(01)+(15)+(10) 33 digits / 30 digits ③ GTIN+Date+Lot+Serial → AI(01)+(15)+(10)+(21) 42 digits
Minimum bar width	① Around 0.49 mm ② Around 0.66 mm ③ Around 0.847 mm

than 90% was evaluated as Grade D. Values other than contrast were, however, generally satisfactory.

For the white solid, which was expected to be a measure of contrast improvement, we reaffirmed that there was a challenge of compatibility between the white flexographic ink and the barcode printing ink. To obtain more stable quality, it is essential to carefully consider the compatibility between the white ink and the barcode printing ink.

In our comparison of the two transfer speeds, 30 m/min and 40 m/min, we confirmed that the faster speed slightly increased the maximum reflectance, that is to say, the black bar became thinner. Other than that, we did not see any major differences. With regard to the content of the barcode printing (type of barcode, data content, and minimum width of the bar), there was no characteristic that deserved special

mention.

For reference, we performed a reading test on the printed symbols under limited conditions.

In this test, the printed sample moved on the transfer line at a speed of 40 m/min and 60 m/min, and the sample was read using stationary-type barcode readers (two laser system models and two camera system models). We found that the accuracy of the reading was fairly high, even with the Grade D barcode samples. Considering that ITF symbols and even EAN-13 symbols printed on ordinary liners are actually employed in spite of their Grade D status, we might expect that a Grade D would be sufficient for practical use if we can suitably set up and adjust the transfer line and reader because the conditions were not satisfactorily optimized in this test.

Fig. 1.9.1-2 Symbol quality of direct inkjet printed barcodes

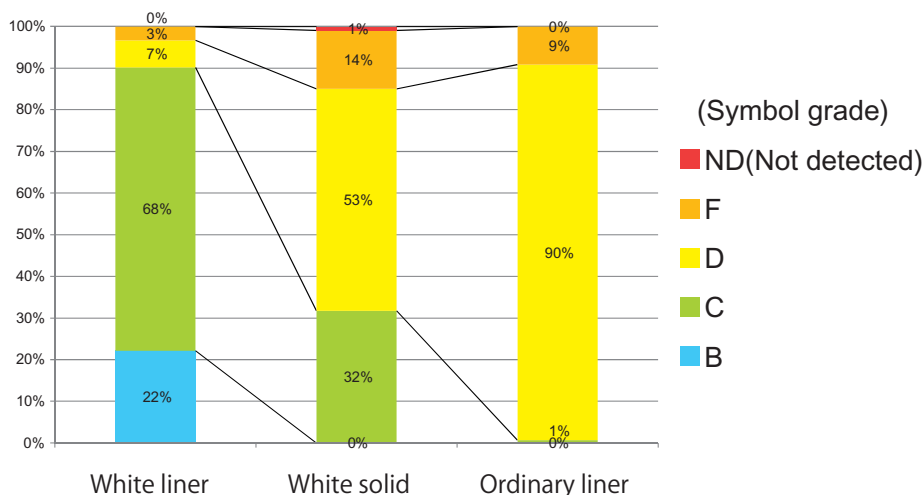
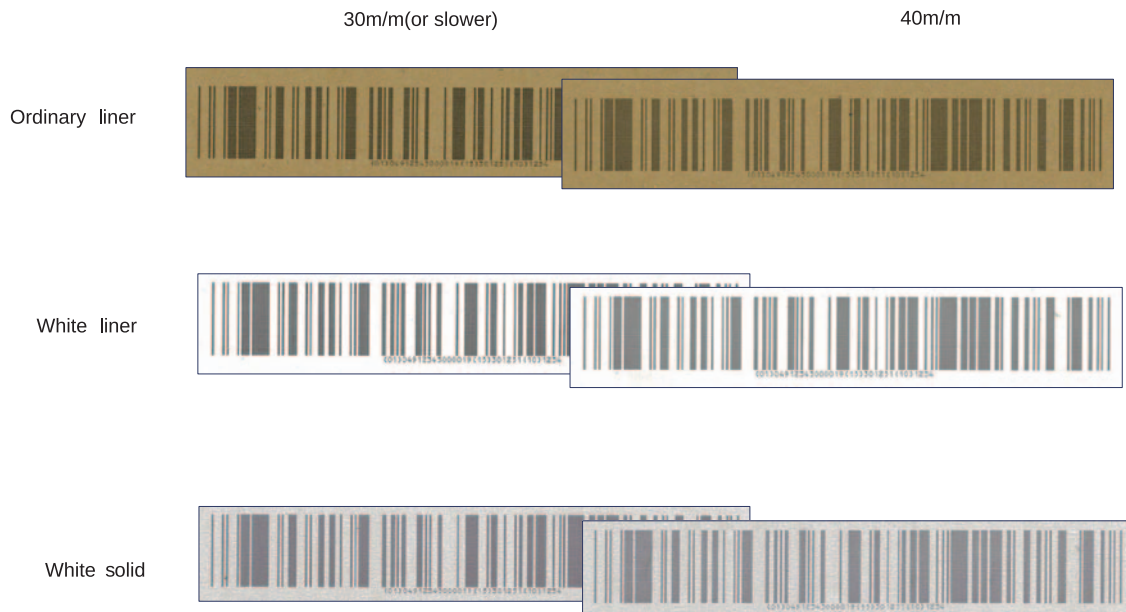


Fig. 1.9.1-3 Difference in printing density by material and transfer speed (image)



1.9.2. Future of barcode direct printing on cardboard boxes

In principle, the quality target for business-to-business applications should always be Grade C and above, even for direct printing on cardboard boxes. But, considering that presswork-based ITF symbols of Grade D are currently being permitted in actual business under certain limitations, it will be necessary to clarify the requirements needed to use direct printing at Grade D level in actual operations. For example, even if the overall evaluation is Grade D, there will be no problem in reading the symbol as long as parameters other than symbol contrast are at Grade C or higher. Or, some argue that even if the contrast is judged to be Grade D, it is not likely that there will be trouble reading as long as the symbol contrast value is 30% or

higher. Consequently, if such printing requirements are clarified and the operability of business-to-business applications is guaranteed, it would be possible to use GS1-128 or other symbols at Grade D level in business under certain limitations, as in the case of ITF.

In addition, the reading performance of barcode readers has been improving and some readers including laser products are capable of processing low-contrast symbols. Furthermore, image readers are becoming more popular in the distribution sector, it may be necessary to review implementation standards in the future.

GS1 Japan plans to continue studying these technical infrastructures to contribute to the development of an environment that enables the effective use of attribute information in the supply chain.

2. eCom (EDI)

2.1 History and Current Status Of EDI in Japan

EDI in the retail sector in Japan started with the Electric Ordering System (EOS) using the JCA Protocol (*1), the standard data communication protocol drawn up in 1980 by the Japan Chain Stores Association (JCA). In the 1990s and thereafter, EDI also came to be adopted for business processes other than ordering. And in the 2000s, based on Efficient Consumer Response (ECR) and Quick Response (QR) procedures, Ryutsu (*2) Business Message Standards (known as Ryutsu BMS) was established for the purpose of achieving of information sharing among companies.

2.1.1 From the JCA Protocol to the Ryutsu BMS

The JCA Protocol drawn up in 1980, became widespread as an EOS for retail businesses. It was designated in 1982 by the Ministry of International Trade and Industry (present Ministry of Economy, Trade and Industry (METI) as the standard communication protocol for the retail industry (J Protocol). After that, the J Protocol was also adopted by retail businesses other than supermarkets as a main tool for EDI. The business procedures covered by EDI expanded from the EOS to shipping and receiving of goods, invoicing and payment. On the other hand, with the spread of the Internet in 2000 and later, the following issues connected with the J Protocol began surfacing:

- Low speed
- Inability to deal with Kanji characters and images
- Necessary communication equipment was discontinued
- Difficulty in adding new data attributes due to the fixed-length formatting
- Message formats differed from retailer to retailer

Concerned about the situation, Japan's two super-

market organizations cooperated and in June 2005 started investigating a next-generation EDI.

Their examinations were performed as part of the project for promoting the optimization of the entire supply chain conducted by METI from FY2003 to FY2005. METI continued the Supply Chain Information System Standardization Project for three years from FY2006 to FY2008 to support standardization measures for supermarket businesses. As a result, in April 2007, the Ryutsu BMS were created as a new EDI standard. The Ryutsu BMS is now being increasingly adopted throughout the Japanese retail industry.

2.1.2 Outline of the Ryutsu BMS

The Ryutsu BMS defines the followings:

Communication infrastructure

Now that the Internet is widely used, the Ryutsu BMS designates the following three standard communication protocols:

- Two server-to-server protocols: ebMS and AS2
- One client-to-server protocol: JX Protocol (*3)

In addition, guidelines for secure internet communication were prepared. And the use of three certificate authorities that meet the guidelines are recommended.

Standard messages

The standard messages are classified into three types and managed for each type of business process model as follows:

- Basic messages

Intended for use at supermarkets, drugstores, do-it-yourself (DIY) stores, etc., 26 basic messages were published on the basis of an ordering business model, which covers from order placement by the retailer and to the shipment and receipt of the placed order. In 2010, retailers and the apparel industry worked

*1 JCA Protocol

This is the standard communications protocol for electronic ordering established in 1980 by the Japan Chain-stores Association (JCA). The communication circuits available for the protocol are public circuits (2,400 bps) and DDX circuits (9,600 bps), and Kanji and images cannot be transmitted. DDX circuits are packet communication services using telephone circuits provided by NTT.

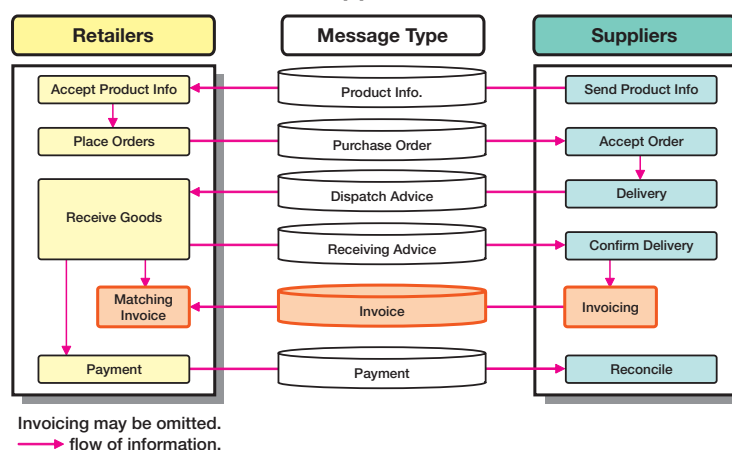
*2 Ryutsu

Ryutsu is the Japanese equivalent of a supply and demand chain, and typically consists of three groups: manufacturers, wholesalers and retailers.

*3 JX Protocol

This is the communications protocol for transmitting messages from a client terminal to a corresponding server over a TCP/IP network. Using the international SOAP-RPC standard, this protocol features functions equivalent to those of the J Protocol. The JX Protocol has become the standard communications protocol for exchanging EDI messages between a client and a server in the Ryutsu BMS.

Fig. 2.1.2-1 Typical Turnaround Business Processes and Ryutsu BMS Messages between Retailers and Suppliers



together to develop peer-to-peer product information data messages.

Department store messages

Japanese department stores have unique transaction models that are different from those of other retailer categories. For example, they register a merchandise purchase when the merchandise has been actually sold, and also they need to manage pre-ordered seasonal gifts for the Japanese custom of giving gifts

twice a year, in summer and at year-end. Therefore department stores use 27 messages in their transactions.

2.1.3 Users' commitment to Ryutsu BMS

According to a survey conducted by GS1 Japan in July 2013, 125 retailers and 205 wholesalers or manufacturers have already adopted the Ryutsu BMS. The survey results by business category and product are described in Fig. 2.1.3-1.

Table. 2.1.3-1 Number of companies the implementing Ryutsu BMS as of July 1, 2013

Retailers			
Business Category	Adopted	Plan to adopt	Subtotal
1. Supermarket	102	10	112
2. Department Store	8	2	10
3. Drugstore	7	2	9
4. DIY Store	4	0	4
5. Cooperative Store	3	0	3
6. Warehouse Club	0	1	1
7. Voluntary Supermarket Chain	1	0	1
8. Discounter	0	1	0
Total	125	16	141
Wholesalers or Manufacturers			
Business Category	Adopted	Plan to adopt	Subtotal
1. Food, Beverage Wholesaler	56	0	56
2. Confectionery Wholesaler	18	4	22
3. Commodities, Cosmetics Wholesaler	22	2	24
4. Drug Wholesaler	5	2	7
5. Apparel, Shoes Wholesaler or Manufacturer	23	11	34
6. Food Manufacturer	24	2	26
7. Household Goods Wholesaler or Manufacturer	9	1	10
8. Packaging Material Wholesaler or Manufacturer	11	9	20
9. Toys and Hobbies Wholesaler and Manufacturer	3	0	3
10. Consumer Electronics Wholesaler or Manufacturer	2	0	2
11. Other Wholesaler or Manufacturer	1	0	1
Total	174	31	205

2.2 Kawamatsu Co., Ltd. –Using Tablet PCs for Ryutsu BMS

Kawamatsu Co., Ltd. is a grocery supermarket chain (annual sales: JPY 7.8B (USD 78M) as of June 2013) with nine stores in Niigata Prefecture. The chain started to adopt Ryutsu BMS with the help of Modal Concept Japan in the latter half of 2011. In this effort, tablet PCs were supplied to the chain's stores to facilitate ordering and delivery checking, and these reduced cost significantly and improved merchandise assortment.

Problems and solutions

Before adopting Ryutsu BMS, Kawamatsu faced the following EDI-related problems:

- 1) Too much paper works: Since message standards had not been established and the conventional system could not fully cope with a variety of ordering types.
- 2) Costly data communication: Communication charges were high due to the slow transmission. Also the communication equipment had become too old to use effectively and the support contracts were to expire.

To solve these problems, Kawamatsu took the following measures in parallel with the introduction of Ryutsu BMS:

- 1) Too much paper works: Kawamatsu altered the system to be able to cope with various ordering types (e.g. regular, in-store promotion, bargain sale, and buyer placements) so as to realize a paperless ordering process. Although Kawamatsu had no distribution center, the advance ship notices (ASNs) could be verified from the stores. This prompted suppliers to introduce Ryutsu BMS because they would be able to eliminate the paper slips, too. Also, Kawamatsu introduced a simplified system using mobile phones and smart phones to exchange EDI data with small-sized suppliers who had no electronic ordering systems (EOS's).
- 2) Costly data communication: Since Ryutsu BMS uses

Fig. 2.2-1 Ordering using iPad



the Internet as a means of communication, communication charges can be reduced. Since associates must move throughout a store when placing orders, Kawamatsu decided to use tablet PCs as the ordering terminals in a wireless environment, in addition to ordinary PCs. Unlike a conventional ordering terminal, which is a dedicated device, the new terminals are general-purpose devices (iPad was chosen for use this time), and therefore much more affordable. Kawamatsu also decided to save the data on cloud storage.

Outcome

As a result of introducing Ryutsu BMS, Kawamatsu saved JPY 8M (USD 80K) in one year (equivalent to 0.1% of annual sales). Ryutsu BMS can now process 85% of procurement in terms of money. A typical example of cost reduction is the time savings for accounting work, since they no longer have to handle paper slips.

This has also had an effect on the work in stores. Since the slip data entry is no longer needed, the delivery record data can be promptly verified. Gross profit can be correctly managed on a category basis, which helps to improve the in-store sales sections. Kawamatsu considers such profit made by the sales section is also an outcome of adopting Ryutsu BMS and is highly satisfied with the benefit brought to the chain.

3. EPC/RFID

3.1 EPC/RFID in Japan

The movement to utilize RFID as a next-generation data carrier within supply chains led to the establishment of the Auto-ID Center at the Massachusetts Institute of Technology in 1999. Over 100 wholesalers, retailers, manufacturers and system vendors from around the world collaborated to advance research on RFID. Those efforts then led to the founding in 2003 of EPCglobal, a new organization that combined RFID tags and Internet technology for the purpose of standardizing and promoting EPC/RFID systems. In this context, in 2004, EPCglobal membership was established in GS1 Japan.

3.1.1 GS1 Japan EPCglobal membership

In 2003, GS1 EPCglobal standards development was being actively performed. Therefore the membership services focused on helping the members participate in the standards development activity and to provide support to include domestic needs in the global standards.

Since a set of EPCglobal standard specifications were already laid down, our focus is now on promoting the implementation and use of these EPCglobal standards. Accordingly, the membership services have shifted to the current and potential users of GS1 EPCglobal standards and Solution Providers who are helping users implement systems based on the standards.

The following services are provided to members:

- Provide information on the trend of standardization and overseas best practices
- Provide tools and support that help members implement GS1 EPCglobal standards
- Facilitate interchange between members and aid

members' standard promotion activities.

3.1.2 Recent activities of EPC/RFID

GS1 Japan's various EPC/RFID promotion initiatives include the following activities.

- Holding regular EPC/RFID introductory courses, including providing a EPC/RFID demo system for users
- Building of EPCIS common infrastructure and demonstrating the system
- Partnership with related organizations (ISO SC31, Japan Automatic Identification Systems Association (JAISA), etc.)
- Holding EPC/RFID related seminars including the EPC RFID FORUM.
- Establishing RFID study committees interested in developing RFID system.

3.2 EPC/RFID Initiatives in Japan

3.2.1 Transport and logistics supply chain visibility: APEC Supply Chain Visibility Feasibility Study Workshop in Kazan Russia

METI announced the Recommendation on Implementation of the Cargo Status Information Network for Enhancing Supply Chain Visibility at the Supply Chain Visibility (SCV) Feasibility Study Workshop in Kazan, Russia. This workshop was held in May 2012. Representatives from various industries, governments, and international standards organizations participated. GS1 Japan provided support by inviting representatives from GS1GO and the MOs of the APEC region. The workshop was held in three ses-

Fig. 3.1.1-1 RFID study committee



sions. In the first session, country representatives shared best practices for enhancing supply chain visibility in the APEC region. Best practices were demonstrated to the audience through concrete activities and benefits of supply chain visibility based on EPCIS technology. In the second session, METI outlined the necessary information to be shared by each stakeholder in the supply chain and introduced its APEC Recommendation. After that, GS1 Japan explained EPCIS, detailing technical points about how EPCIS is structured and suggesting how to develop an ideal information network to enhance supply chain visibility. In the third and final session, the UN/CEFACT and WCO reported on the development progress of international standards and efforts to seek harmonization and interoperability with other international standards.

Through this SCV workshop, the results of relevant projects including best practices were understood and recognized. The benefits of supply chain visibility were acknowledged and the scope of the APEC Recommendation was confirmed. EPCIS was recognized as the key technology that can solve various issues in supply chain visibility. After the workshop, the APEC Recommendation on supply chain visibility was reported to the Committee on Trade and Investment and formally recognized as an achievement of the APEC Supply Chain Visibility Feasibility Study Workshop.

The Recommendation was endorsed by the APEC Trade Ministers' Meeting that took place in July 2012.

3.2.2 Japan's initiatives for EPCIS Showcase

GS1 Japan has developed a common platform, a "test-bed" for EPC/RFID users called "Showcase". The showcase is based on EPCIS and provides opportunities for EPC/RFID users to try and learn how EPCIS works. In 2011 and 2012, GS1 Japan conducted a pilot improv-

ing supply chain visibility of agricultural produce using the Showcase.

Although GS1 Japan has been promoting EPCIS, it is taking much time to expand the use of EPCIS in the Japanese market. One of the reasons is that EPC/RFID users find it very difficult to understand the concept of EPCIS. They also find it difficult and costly to develop a prototype system to try out the EPCIS functions. Also in many cases, technical associates may be at a loss as to where to start a project because of the huge scope of the visibility system. We believe the showcase will help the users who are interested in but hesitant to actually use EPCIS.

GS1 Japan, with support from Auto-ID Lab Japan, IBM Japan and Daiwa Computer, has been developing an application system on this showcase to demonstrate the effectiveness of EPCIS. This application system is an agricultural traceability system with which a consumer can check the quality of an agricultural produce. Having been allocated unique ID (SGTIN) and registered other information such as sweetness and the best date to eat at a farmer's site, melons were distributed from the farmer to retailers with EPC/RFID tags.

In this pilot, we have learned a lot of things. We confirmed that EPC/RFID is efficient for the melon distribution from the farmer to retailers as follows.

- 1) With the ability of EPC/RFID, key players on supply chain were able to know exactly when the melons left the producer's warehouse and when they reached the supermarkets. Farmers, shipping agents and retailers were very satisfied to obtain this valuable information.
- 2) Detailed information about melons is required not only by consumers, but also by shipping agents and retailers. EPC/RFID could bring those information such as sweetness of fruits and the best date to eat which were stored in EPCIS server.

Fig. 3.2.2-1 EPC/RFID tags on melon and box

Melon ID tag (SGTIN)+QR code



Box ID Tag

Power ID (Temperature sensing)

Some Japanese farmers want to sell their fruits directly overseas. With the success of the pilot, GS1 Japan decided to conduct second phase of the pilot to demonstrate that EPCIS works effectively for selling online globally. With the cooperation and support of GS1 Hong Kong, the second phase of pilot on the shipping of melons from Japan to Hong Kong was conducted. Using the EPCIS we supported providing detailed product and logistic information.

By accumulating the results we are striving to convey to the EPC/RFID potential users just how important visibility is.

3.3 Industry Business Cases

3.3.1 Apparel industry: Item level tagging use case

I.T.'S. international is a Japanese private-label clothing and accessory manufacturer founded in 2009. In addition to designing and manufacturing its own line, I.T.'S. also has a chain of retail stores, the first of which opened in the heart of Tokyo's Harajuku fashion district in February 2010. As of May 2013, there were 11 I.T.'S. stores in operation.

I.T.'S. was an early adopter of EPC. The company's management realized the many advantages this technology could bring to their stock management, store operations and logistics, and decided to use it as a competitive advantage. As a result, they were the first company in Japan to implement UHF item-level tagging. In every I.T.'S. store, every single item—jackets, skirts, trousers, socks—has a hangtag or product label with an EPC tag embedded in it.

Stock-taking is efficient for store employees. EPC tags encoded with GS1 Serialized Global Trade Item Numbers (SGTINs) are attached to individual articles at the manufacturing factories. They are first read when

clothing items arrive at distribution centers. Once the shipment is received and contents are verified, each carton of items is labeled with an EPC/RFID tag. This tag is encoded with a GS1 Serial Shipping Container Code (SSCC), uniquely identifying it as a logistics unit. This allows the entire carton to be inspected in seconds when it arrives at a retail shop, simply by scanning the label with a handheld EPC/RFID reader. The tags on the individual items of clothing enable a full-store inventory to be taken at any time in just a few hours.

I.T.'S. has achieved significant benefits by deploying this solution, saving time and money on store operations. Their store each stocks about 15,000 items. Performing a store inventory without this system would likely take two employees four days to complete. With the system in place, a single person can take a complete storewide inventory in less than two hours. The shops now take inventory every month to ensure increased inventory accuracy.

The EPC/RFID system does not only benefit workers in I.T.'S. stores—their shoppers are also seeing a noticeable difference. In I.T.'S. boutiques equipped with this system, when a customer brings articles of clothing to the check-out counter to purchase them, a clerk simply places the items on the countertop and the total price appears instantly on the cash register. The points of sale are equipped with RFID scanners that immediately read the customer's items and calculate the amount to be paid.

I.T.'S. is expanding its presence in Tokyo, and all new shops will be equipped with this system. The company is also looking to take advantage of other services made possible by the item-level EPC/RFID tags that are already on their products, such as smart fitting rooms, which would suggest other items that would match what the shopper is trying on, or RFID-based Electronic Article Surveillance to prevent shoplifting.

Fig. 3.3.1-1 I.T.'S. international shop, inventory-taking and EPC hangtag in the shop



3.3.2 Gas industry: Activities of the Japan Industrial and Medical Gases Association

Some 15 million gas cylinders are estimated to be in distribution in Japan. A variety of gases such as oxygen, hydrogen and CO₂ are widely used in industry and there are also a huge number of high-pressure gas cylinders in use. There had been no standardized method of managing gas cylinders. Some companies managed them using internal barcode systems while other companies used numbers engraved on the cylinders. It had been difficult to determine the actual owner of a neglected cylinder because two thirds of the gas distributors had not adopted a barcode system. They just visually read the number engraved on a cylinder and copied it on a paper form. Neglected or missing high-pressure cylinders pose a very serious problem because of the risk of explosion due to corrosion.

The member companies of the Japan Industrial and Medical Gases Association (JIMGA) had tried to solve the problem using a barcode system, but it was not successful since there was no standardized barcode management method and no interoperability among the gas suppliers. In addition, barcode labels were not durable enough for business operations in such a harsh environment. JIMGA thus decided to use EPC/RFID for managing gas cylinders and developed several types of EPC/RFID tags to attach to various types of cylinders.

Each tag encoded with a Global Returnable Asset Identifier (GRAI) is read or written at gas cylinder filling stations by means of handheld scanners, and trucks carrying RFID-tagged cylinders pass through antenna gates for bulk reading of their cylinder shipments.

By using the standardized RFID system, JIMGA expects not only to solve problems such as the handling of neglected or missing cylinders but also to achieve more efficient distribution of gas cylinders by managing them as assets. As of March 2013, this system has been implemented by 9 companies at 58 distribution centers and EPC/RFID tags have been attached to about 248,000 gas cylinders. JIMGA is planning to expand the implementation.

About the Japan Industrial and Medical Gases Association (JIMGA)

JIMGA strives to improve and rationalize the production, distribution, and use of industrial and medical gases as well as the production and marketing of facilities and equipment associated with medical gases and equipment used for home therapy. Number of member companies: 1,200.

3.3.3 Food industry: Cage trolley management

The Cage Trolley Management System was developed by Kibun Trading Inc., a member company of the Kibun Group, and utilizes EPC/RFID technology to manage cage trolleys as company assets. In October 2008, the Kibun Group implemented this system at

Fig. 3.3.2-1 EPC/RFID operations at a gas cylinder filling station



major distribution centers for refrigerated foods. An EPC tag, which includes a GRAI, is attached to each trolley. The serial number part of the GRAI, which indicates the year and month of purchase (YYYYMM) followed by the trolley number (-XXX), is prominently displayed on each trolley.

To track the location of the trolley, the EPC tag is scanned during shipping and receiving. During shipping, the barcode of the delivery point is scanned with a handheld reader. This reader is also used to scan the EPC tag. This creates an association between the delivery point and the trolley used. When the trolleys are returned, they simply pass through a gate equipped with an EPC/RFID reader which ↗

electronically reads and stores the returned trolley information.

By tracking the location of each trolley, it is possible to reduce the risk of loss. This enables the company to better manage the number of trolleys needed. Knowing the frequency of use also helps the company to manage the maintenance and life cycle of the trolleys. Through the implementation of the Cage Trolley Management System, the Kibun Group has improved the efficiency of its shipping operations and asset management.

Based on the success of this system, the Kibun Group has decided to implement EPC/RFID in all of their distribution centers throughout Japan.

Fig. 3.3.3-1 EPC/RFID operations at a distribution center for refrigerated food



Cage trolley



Cage trolley name board



Fitting attachment for EPC tags



Reading EPC tags

3.3.4 Book publishing industry: item level tagging use cases

In Japan's publishing industry, the high return rate of books, which is estimated to be about 43%, has been a longstanding issue. In the nation's traditional book trade, consignment ordering, which allows bookstores to return unsold items anytime, is commonplace. This leads to retailers placing more orders than they can actually sell and then having too many returns.

Shogakukan, one of Japan's major publishers, has been tackling this issue through RFID implementation since 2008. As of May 2013, Shogakukan has attached UHF Gen2 tag labels to 19 titles with total 2.4million copies. Each copy is uniquely identified with RFID, so Shogakukan can try setting two different trade conditions to each title to compare return rates. One ↗

trade condition is conventional consignment ordering and the other is optional non-consignment ordering, which offered bookstores a higher profit margin on each copy sold, but set some restrictions on returning unsold books. The publisher thought this would motivate retailers to sell more books and lead to a more realistic number of orders placed.

The booksellers themselves also found another benefit from optional non-consignment ordering.

Every bookseller was able to receive the exact number of books that they ordered with the non-consignment option. In pre-tag days, the total number ordered sometimes exceeded the number of copies in the first printing. In such a case, publishers are unwilling to print extra quantities when there is a high risk of returns.

As a result, the return rates for most of the tagged titles were reduced significantly. Shogakukan was sat-

ified with this result and it is planning further implementation in 2013.

Moves to introduce RFID tags have begun not only in publishing companies but also in bookstores.

Kinokuniya Co., a large chain of bookstores operating across Japan, on July 15, 2010 began attaching UHF Gen2 tags to the foreign publications it sells. Attaching tags to all of its stock of foreign publications would involve processing some 2,100,000 copies. The prices of foreign publications differ even for the same title because of differing exchange rates at the time the item is imported. In the past the International Standard Book Number (ISBN) of the publication was the only data they could use to identify publications and manage sales. By utilizing electronic tags capable of identifying each copy, the company can now more accurately analyze its sales. Kinokuniya aims at increasing the efficiency of its inventory control, too.

Another large bookstore chain, Maruzen Bookstores Co., started tagging its stocks of foreign publications at its Marunouchi main store on January 2011. The tagged publications amount to approximately 600,000 copies. The tagged books are staff-friendly. First of all, every book can be efficiently identified. It was not easy for shop associate to find a requested book on the shelves because the books and their titles are written in various foreign languages. By passing a handheld RFID reader over the books on the

shelves, associate can locate a given title because the reader beeps when it reads the designated book tag.

In addition, the RFID function of reading the data instantaneously can help the associate know the actual inventory and prevent lost sales opportunities. For example, important customers who usually purchase foreign books in volume request the list of available books in advance. Associate reads the tags of the book in the store and update inventory data because inventory data may not always be accurate. The store can provide the customers accurate list on the day referring the data. This is an advantage that cannot be provided by a POS sales reports or a barcode system.

Maruzen Bookstores Co., is planning to apply this RFID functions to enable effective shelf management for foreign books. At present, floor space for foreign books limited and so is their sales. Moreover, it is difficult to employ personnel who are familiar with foreign books, especially in regional cities.

However, RFID function enables to identify every book in shelves easily, instantaneously, and constantly. So Maruzen Bookstores Co., is considering to have the local shops scan and send the data of foreign books on the shelves periodically to the expert foreign book associates in the headquarter. Then the expert associates would review the data and advise on the effective shelf management including the book selection and layout in the shelf.

Fig. 3.3.4-1 Tagged books and process of checking books returned from bookstores



Fig. 3.3.4-2 Reading EPC tags in the bookstore (Inventory-taking and checkout at POS)



4. Solutions

4.1 Healthcare

4.1.1 Pharmaceutical products

4.1.1.1 Prescription drugs (Rx)

Medical errors and accidents happen so frequently that the need to standardize the supply chain from manufacturers to patients is widely recognized in the healthcare industry. And the Ministry of Health, Labour and Welfare (MHLW) announced an invitation for public comments on the draft "Implementation Guideline for Bar-coding of Prescription Drugs" in March 2006. This guideline was drafted with the cooperation of FPMAJ (*1) and GS1 Japan. After gathering various comments from the public up until June, MHLW announced the guideline in September 2006.

This guideline adopts GS1-128, GS1 DataBar Limited and GS1 DataBar Limited Composite Symbology as well as GS1 DataBar Stacked and GS1 DataBar Stacked Composite Symbology as shown in Fig. 4.1.1.1-1.

MHLW decided to start full application of the Guideline in September 2008. For this reason, from spring to summer of 2008 labeling using the GS1 Standard System has been introduced at the plants of most domestic pharmaceutical manufacturers. The guideline requires the labeling of GTIN, expiration

date and lot number on biological products only, but pharmaceutical manufacturers have also begun labeling other products such as general injections and drugs for internal use on a voluntary basis. Significant effects of the labeling are anticipated.

The Guideline was revised in June 2012. To further ensure compliance with international standards throughout the entire industry, the Guideline requires that dispensing unit (primary packaging) e.g., PTP sheets (Press-Through Package sheets: blister sheet) be barcoded with a GS1 DataBar encoding appropriate GTIN.

4.1.1.2 Over the counter drugs (OTC)

MHLW has not yet commenced a standardization initiative for over-the-counter (OTC) drugs, though most of them already bear EAN-13 symbology on their packages.

4.1.2 Medical devices

4.1.2.1 The guideline issued by MHLW

The Japan Federation of Medical Devices Associations (JFMDA) resolved to use the EAN/UPC and GS1-128 symbol in 1998, which was followed by the publication of the guideline in 1999 with the help of GS1 Japan. However, the use of these standards had been

Fig. 4.1.1.1-1 GS1 Barcode on pharmaceutical product packages



*1 The FPMAJ Federation of Pharmaceutical Manufacturers' Association of Japan

optional for each company.

In March 2003, MHLW published its "Vision for the Medical Device Industry." The accompanying "Action Plan" strongly encouraged the industry to promote the use of information technology systems to build a new product database and use bar codes to increase patient safety.

In 2004, for the purpose of inducing the implementation of the agreed-upon standards, MHLW started monitoring their use through JFMDA. MHLW has also been monitoring the coverage of item registration in the database.

In September 2007, MHLW announced the draft guideline for barcode marking on medical devices, which was prepared by joint effort with JFMDA. After going through public comment procedure twice where the draft was modified accordingly, MHLW issued the barcode making guideline in March 2008.

4.1.2.2 Implementation of the guideline

According to the survey conducted by MHLW in 2012, 80% of medical devices marketing in Japan are regis-

tered in MEDIS-DC database and 97.6% are shipped with GS1-128 symbol labels as shown below.

4.1.2.3 Direct marking for surgical instruments

Japan Association of Medical Equipment Industries (JAMEI; Current organisation name is "Japan Association of Medical Device Industries (JAMDI)") published the first guideline for laser marking 2D symbols on surgical instruments for the purpose of patient safety, traceability and effective stock control at the hospitals in November 2006. Since QR code is ISO standardized and so popular in Japan, JAMEI had selected QR code in addition to DataMatrix as standard for 2D data carrier.

In July 2010 the GS1 Healthcare Japan (See 6.2) also established the "Subcommittee for the Marking of Surgical Instruments," and surgeons at medical institutions, surgical instrument manufacturers, laser marking agents and other interested parties are studying the method for marking the GTIN and serial numbers on surgical instruments.

Table 4.1.2.2-1 MHLW Guideline for barcoding medical devices

	GTIN (01)	Expiry or Use by Date (17)		Lot # or s/n (10/21)	
	All levels	Individual Package	Inner Package (*1) and Outer Package (*2)	Individual Package	Inner Package (*1) and Outer Package (*2)
Specially controlled MD, etc (*3)(incl. specially designated maint. Mgmt. required MD)	◎	◎	◎	◎	◎
Designated insured med. material	◎	◎	◎	◎	◎
MD other than the above	◎	○	◎	○	◎
In vitro diagnostics	◎	◎	◎	◎	◎
Consumable Supplies other than Medical Devices (*4)	◎	—	○	—	○

◎ = Required

○ = Optional

Table 4.1.2.2-2 Barcoding efforts on medical devices in Japan

(Results of the MHLW survey: Answers from 581 Companies)

	As of 30 September, 2012	As of 30 September, 2011
GTIN-13	99.1%	99%
Registered to MEDIS-DC Database	80.0%	79%
BarCode on Individual Package	81.1%	79%
BarCode on Inner Package	97.6%	97%

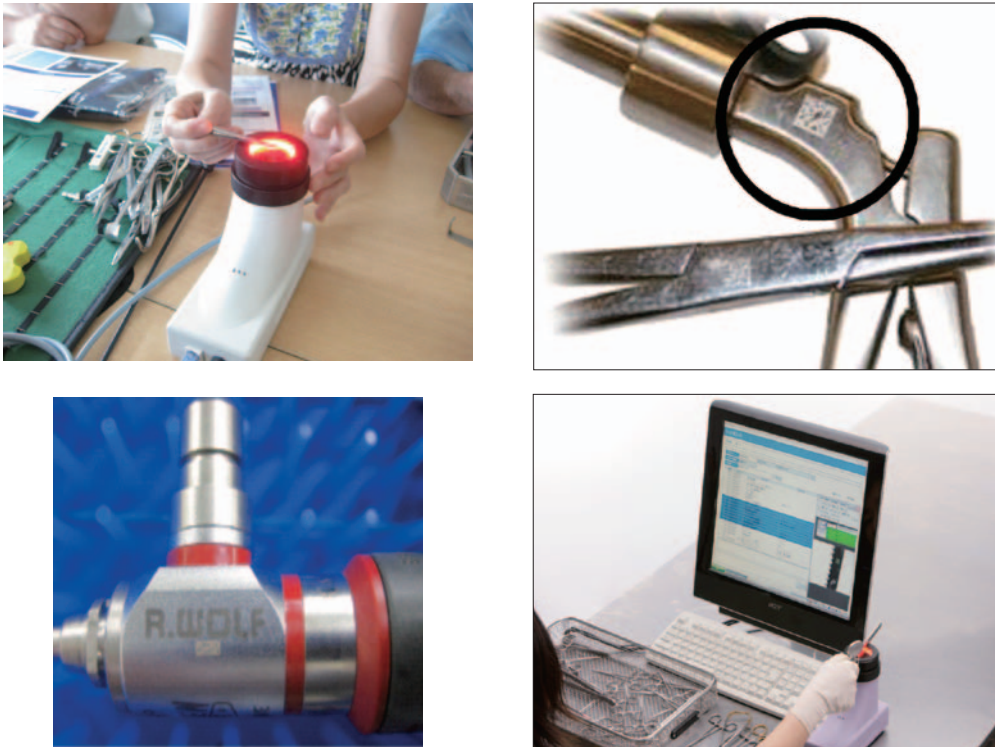
(*1) Inner Package refers to the package that contains a fixed quantity (does not change on order) of individual packages of the same product.

(*2) Outer Package refers to the package that contains a fixed quantity (does not change on order) of inner packages of the same product.

(*3) Within the category of the specially designated maintenance management required medical device, marking on individual package is voluntary for large medical devices such as the installation-controlled medical device (i.e. "Installation-controlled medical device" stipulated in Article 93, Paragraph 1 of the Enforcement Order of the Pharmaceutical Affairs Law).

(*4) Out of the consumable supplies other than medical devices, pharmaceuticals for medical use are not subject to the guidelines.

Fig. 4.1.2.3-1 Surgical instruments



4.2 Mobile Solutions

The following section explains advanced solutions adopting mobile phone and/or QR codes. Specific cases are also explained.

4.2.1 Smart ticket service using Security QR codes (SQRC)

Shiki Theatre Company has nine theatres throughout Japan and stages about 3,000 performances per year including both overseas and original musicals. In July 2010, the company started a ticketless service called Shiki Theatre Company Smart Ticket in its Natsu Theatre using Security QR codes (SQRC) developed by

Denso Wave Incorporated in 2007. By April 2011 the Smart Ticket was introduced in all of the Shiki theatre venues throughout Japan.

Shiki enhanced security by adopting SQRC instead of normal QR codes to prevent purchases for reselling purposes and counterfeit tickets.

The mechanism is as described below. Users purchase tickets on Shiki's online Ticket reservation website. When purchasing, they request to receive SQRC Tickets by mobile phone.

The SQRC Reader Admission System consisting of an SQRC reader, a screen, and a printer (Fig. 4.2-2) is installed in each theatre.

Audience are allowed admission after the QR Ticket

Fig. 4.2.1-1 Smart ticket usage image



displayed on their mobile phone is successfully scanned with the SQRC reader. If users call in their reservations by phone, they receive paper tickets by postal mail on which the SQRC is printed, so they can be admitted by scanning the paper SQRC with the reader. When the reader scans the SQRC, a seating chart is output from the printer. As the number of users increase, the system will gain recognition and smoother admission procedures are expected in the future.

4.2.2 Prize promotion using QR codes and mobile phones

The Unique QR code is a QR code with a unique serial number. Toppan Printing Co., Ltd. has made it possible to print Unique QR codes directly on the packages of individual products. Unique QR codes are being printed inside the packages of confectionery, beverages and other products and are being used as proof of purchase in prize promotions using mobile phones by leading manufacturers such as Meiji Co., Ltd., Kataoka & Co., Ltd., Ajinomoto Co., Inc. When consumers read these Unique QR codes with their mobile phones, they can access the prize pro-

Fig. 4.2.2-1 Products using unique QR codes



4.2.3 Inventory management system using mobile phones

Muse, a retail store operated by Hakutsuru Sake Brewing Co., Ltd., is a specialty store that deals with a wide range of products from low-inventory products such as sake cups handmade by potters to ↗

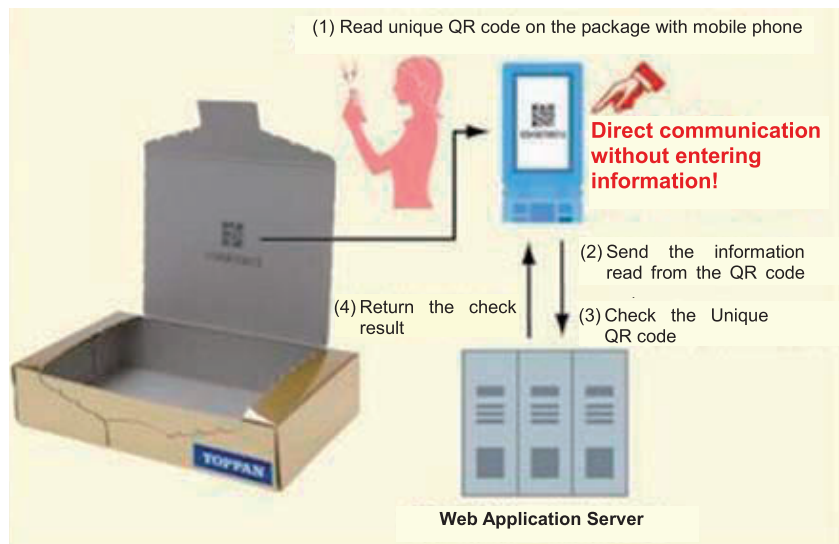
Fig. 4.2.1-2 Admission system installed at the entrance of the theatre



motion website where their serial numbers are ↗ automatically entered in prize drawings. Consumers can easily participate in prize promotions without needing to manually enter the website URL and serial numbers.

A Unique QR code can be used to limit participation to only one submission per number, as the unique number for the package is recorded in the system, which would invalidate repetitive use of the same number. Toppan Printing Co., Ltd., which also provides secretariat services for prize promotions, has confirmed that participants in promotions using Unique QR codes are almost twice as many as those in similar promotions that requires the consumer to key enter the unique number.

Fig. 4.2.2-2 Image of Unique QR codes usage



supplementary products such as appetizers and snacks. The store has improved its inventory management using mobile phones with barcode readers and cloud services. Product master data of all the products sold in the store are registered in mobile phones. When a product barcode is scanned with a mobile phone, the phone displays the product information.

Fig. 4.2.3-1 Mobile inventory management system



Muse



Mobile phone with barcode reader

Therefore, inventory-taking is done by entering the quantity in the phone.

Placing orders requires scanning barcodes, entering quantities, and selecting business partners. The mobile phones themselves do not have a function to check for value errors, but instead the business package system checks them.

Introducing this inventory management system using mobile phones made it possible to complete the inventory-taking within 6 hours. Before adopting the system, it took 2 days for inventory management. In addition, since mobile phones are more compact and lighter to use than dedicated terminals, the inventory-taking was easier to perform.

4.2.4 iPhone applications in beauty and barber industry

The National Beauty & Barber Manufacturers' Association Japan (NBBA) has supported the development of mobile applications for smartphones, such as the iPhone, and started to distribute them for free on the Apple App Store to provide information to shops, stylists, and consumers. These applications have been developed in cooperation with content providers for smartphones.

Currently, four menu categories of information are available: magazines, haircut styles, videos, and product information.

Stylists are able to use these applications to exchange

Fig. 4.2.4-1 Main menu (Left) Introduction of magazines (Center) Image information (Right)



Fig. 4.2.5-1 Email newsletter on the phone's screen

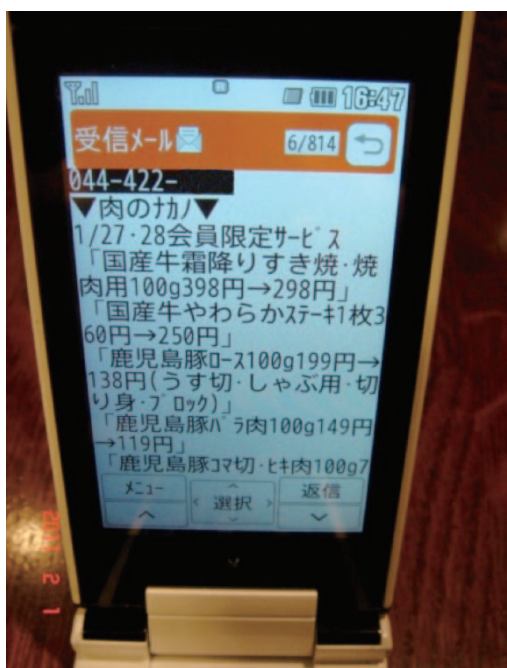


Fig. 4.2.5-2 Digital information board installed in front of the station



hair style images and communicate with other stylists. It has raised the awareness of users, beauty and barber shops through the introduction of information media such as magazines that are not readily available in Japan. The challenge is securing income sources to support operating costs.

4.2.5 Shopping district aiming to increase customers in mobile business

The Motosumi Oz Street Shopping District is located near Motosumiyoshi Station in the suburbs of Tokyo. The Oz Family Club is an email newsletter providing information on child-care, local events, and shopping from the shopping district association. The newsletter had about 3,000 subscribers as of February 2011 and this has been the average number of registered subscribers.

Using the slogan, "Valuable and convenient information from your shopping district," the shopping district began soliciting new subscribers by offering the benefits of timely information.

As the number of subscribers to the Oz Family Club rises, some shops are seeing an increase in sales.

In 2010, a digital information board was installed in front of Motosumiyoshi Station that displays various information, such as about shops in the shopping district and child-care. (Fig. 4.2.5-1)

In addition, the digital information board has a FeliCa (Osaifu-Keitai: a contactless IC card technology developed by Sony) reader and writer from which users can receive shop information and coupons directly to

their mobile phones.

The shopping district has begun considering a more attractive mechanism with a view toward introducing a loyalty point card system using Twitter and Facebook.

In addition to its current activities, the shopping district plans to promote cooperative use of the email newsletter and digital information board through mobile phone media and provide new services.

4.3 GS1 Extended Packaging Data Structure Solution

4.3.1 GS1 Extended Packaging data solution for promotion

Mandom, a manufacturer of men's cosmetics, ran a marketing campaign exclusive to a drug store chain for 8 weeks in 2012.

Mandom decided to use the data structure of URL with GTIN. This is the data string that GS1 Extended Packaging designates to be generated after scanning GS1 QR Code or GS1 DataMatrix. The target products in the campaign were seven types of hair waxes for men. The company thought that it could efficiently obtain information on consumers who participate in the campaign by the specific products they bought. Mandom sold these hair waxes by adding to each product's package an application card on which a QR code combining the brand URL and GTIN was printed. Before using this QR code application, Mandom had

run its marketing campaigns for men’s cosmetics using postcards. Mandom acknowledged that the time and trouble to fill in a postcard and the cost of a stamp were not attractive to consumers, and this resulted in low participation rates.

The company’s change to the use of QR codes brought about an increase in the number of applicants. Using the data structure of URL with product GTIN facilitated the tasks of checking and summarizing the participation results by each GTIN.

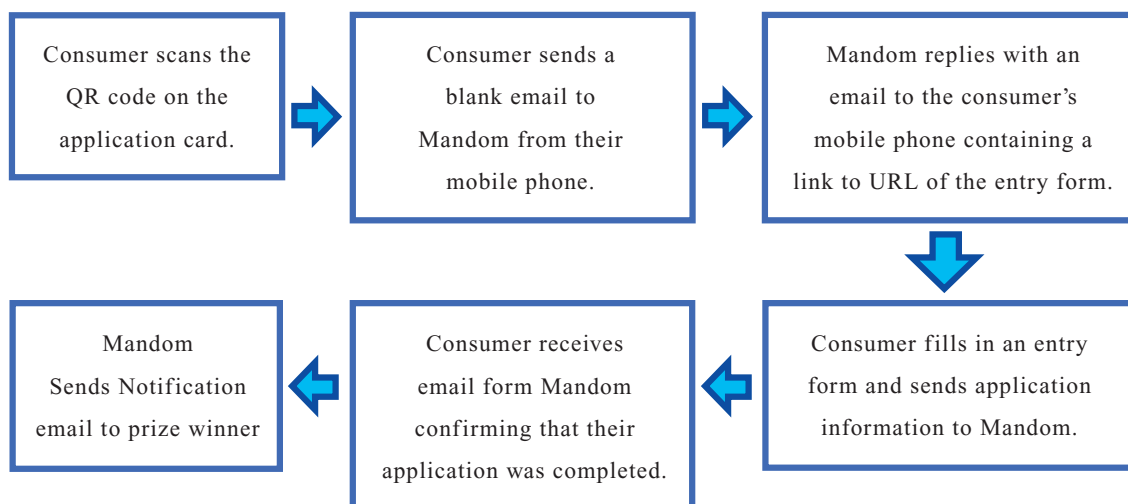
Hiroto Furuya, Mandom’s Publicity and Sales Promotion Department, comments on this campaign. “When I first learned about the GS1 QR code, I knew immediately that we could use it for our sales promotions. A particularly attractive advantage is that the new format of QR code includes a unique GTIN linked with a product. We can analyze this information in combination with store POS data during a campaign and the data can be used for post-sales marketing. ↗

We are always looking for new sales promotion methods, and hope to continue to find ways to extend the use of this method in the future. We feel that GS1 QR codes have great potential. We expect that specialized software for reading GS1 QR codes will be developed soon.”

Fig. 4.3.1-1 Promotion application card



Fig. 4.3.1-2 Process flow of mandom’s promotion



4.3.2 GS1 Extended Packaging data solution for used products

Used product market is growing in Japan. It is important for brand owners to reach the users and provide user manual and recall information even on used products. Sometimes, as for used products, sufficient product safety information is not provided or user manuals are lost. In the Japanese market, as a national policy for consumer protection, the government accelerates mandatory recalls, and voluntary recalls, if a product has suspected defects, illegal labeling, ↗

misleading labeling, or other features which might adversely affect consumer safety and security.

The Japan Technical Designers Association (JTDNA)(*1), a nonprofit organization that sets quality guideline of product user manual, announced on August 1, 2013 that it will proceed with a pilot using the QR codes to meet Product Liability requirements including providing user manuals to users and obtaining user information.

The pilot will be conducted as follows:

Two types of QR codes are prepared: one is displayed on the body of product and the other on the prod-

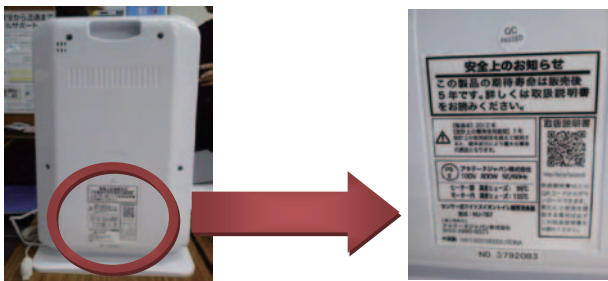
(*1) The Japan Technical Designers Association (JTDNA) is the only specified nonprofit corporation in Japan that examines and evaluates the quality of user manuals.

uct's user manual for different purposes.

Purpose 1: Retrieval of user manual

This pilot uses conventional QR codes because some mobile phones are not yet capable of reading GS1 QR codes. Since the products used for this pilot are not assigned a GTIN, the company URL and a product name is encoded to indicate the product instead of a GTIN. Users can obtain the user manual in PDF format by scanning the QR code on the product body. The manual has been specially designed so that it is small in size for the phone to download and the information is easy to read on the display of a smartphone. The manual was verified by JTDNA in advance and carries a certification mark for the predefined quality.

Fig. 4.3.2-1 A label with QR code



Purpose 2: Registration of user information

The QR code on the manual is used for user registration. The person who bought used product doesn't have a way to register user information.

One of JTDNA's member companies conduct pilot test to obtain users' information for used products. When users buy the used product, they can scan QR code on the product's manual by mobile device. The device shows user's registration site where uses are requested to enter their e-mail. After their registration, they will receive information on recalls, replacements recommendation, etc.

After the pilot, they plan to introduce GS1 QR code in the future.

Some of major mail-order companies are also interested in this registration process.

4.3.3 Promoting GS1 Extended Packaging solutions

4.3.3.1 Development of GS1 QR code reading demonstration software

In order to promote Extended Packaging solution, we need to demonstrate its value by showing examples how it works and helps brand owners communicate with consumers to the potential users. At the same

time, it is essential to explain what the reading software needs to do to encourage solution providers to develop marketable applications. For this purpose, GS1 Japan developed software for iOS with the help of Denso Wave Inc. The software reads GS1 QR Code and processes the data per GS1 Standards. Additional feature of resolving lot number together with GTIN with URL is incorporated. The software supports only an iOS-compatible device now. We plan to develop Android-compatible version in the near future.

Fig. 4.3.3.1-1 Image of GS1 QR code reader program



Fig. 4.3.3.1-2 Promotional brochure



4.3.3.2 Reaching out to potential users

GS1 Japan takes advantage of various occasions including seminars and industry exhibitions to promote the Extended Packaging solution. We organized a mobile seminar in March 2013. The topics included "Big Data" Era and Consumer, GS1 B2C Standards Development and Benefit of GS1 Extended Packaging for consumer goods promotion. More than 100 people attended the seminar.

GS1 Japan participates in several industry exhibitions including Retail Technology Exhibition and Wireless Communications Exhibition. In every occasion, Extended Packaging solution is explained using the demonstration software. We also published a flyer explaining the business cases of Extended Packaging application in paper and online.

5. Database Services

5.1 JICFS/IFDB (Japan Item Code File Service/Integrated Flexible DataBase)

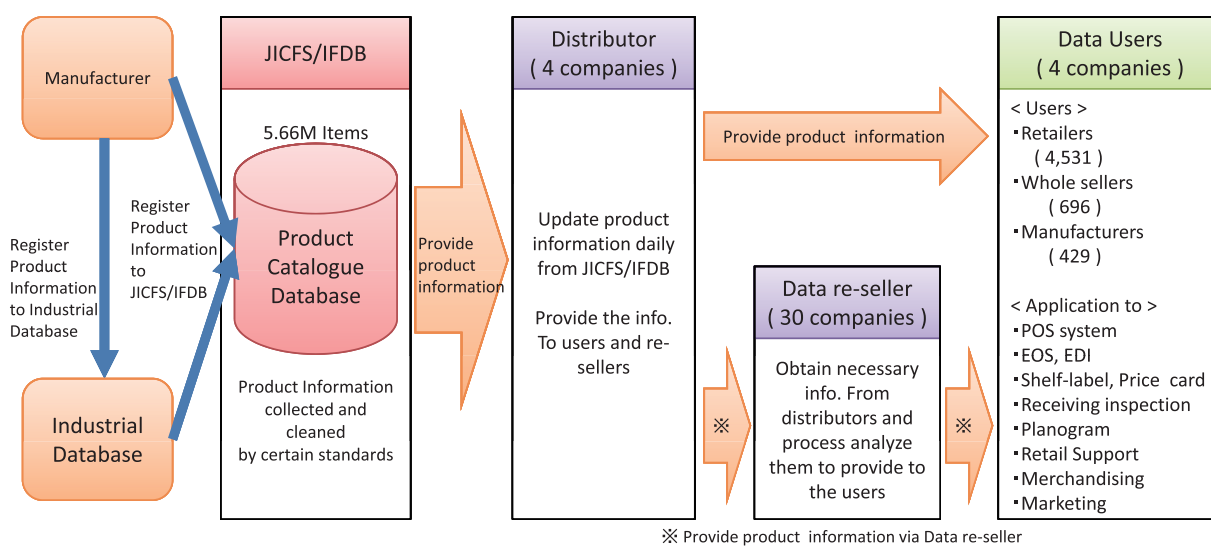
Since 1988, GS1Japan has been operating the JICFS/IFDB database of product catalogues and has been collecting and maintaining basic product data, e.g., GTIN, product names, product categories, weights, and amounts. This database is used for POS's product masters at retailers and EOS masters between wholesalers and retailers as part of the supply chain information infrastructure. The JICFS/IFDB database is recently being used for a variety of other purposes, including online shopping portals and for marketing research. Firms operating online shopping portals use GTIN for product information control since stores in

their portals manage product information using their own codes and product names. These portal firms also use JICFS/IFDB to unify the management of their product information because the same products have often been registered under different names and categories.

The use of the JICFS/IFDB has been promoted not only in the distribution industry, where the database is already in wide use, but also in the area of social welfare. For instance, this database has been used for voice guidance experiments in which vision-impaired consumers themselves can scan a product's barcode and have their personal computer or other device speak the name of the product.

Product data is collected and arranged according to JICFS/IFDB standards and is then offered at cost to

Fig. 5.1-1 JICFS/IFDB system flow



※ Provide product information via Data re-seller

Table 5.1-1 JICFS/IFDB number of registered items by category and year (at end of March)

	2009	2010	2011	2012	2013
Food	841,245	947,898	1,043,430	1,123,796	1,209,636
Commodity	483,683	533,279	590,008	628,054	673,700
Recreation and Miscellaneous	240,320	277,535	334,197	382,640	417,922
Durable Goods	153,531	173,835	195,070	211,385	230,718
Apparel, Personal items & Sporting goods	150,814	167,611	183,405	204,713	222,660
Other	3,677	3,608	3,494	4,585	3,315
Active item Total	1,873,270	2,103,766	2,349,604	2,555,173	2,757,951
Inactive Data	3,104,154	3,104,154	3,104,154	3,104,154	3,104,154
Grand Total	4,977,424	5,207,920	5,453,758	5,659,327	5,862,105
Increase in number of items (year-on-year)	179,243	230,496	245,838	205,569	202,778

retailers, wholesalers and other users via distributors (Fig. 5.1-1).

As of March 2013, product information data registered in the JICFS/IFDB covered over 5 million products from 30,000 manufacturers. About 5,700 companies, of which 80% are retailers and 12% are wholesalers, currently use the database.

By using product information managed by the JICFS/IFDB, user companies can perform the communications, inquiries and registration tasks related to product data promptly, precisely and at a low cost. As such, the product information is being widely utilized by small and medium businesses.

5.1.1 Example of using JICFS/IFDB

An enterprise provides a mobile content service to support the health of users. The application uses various functions including pedometer and GPS built into the mobile devices.

One feature of this service allows users to check the calorie counts of packaged foods. Before launching the service, the company built an original database of ↗

food product names and their calories, but it did not include GTIN.

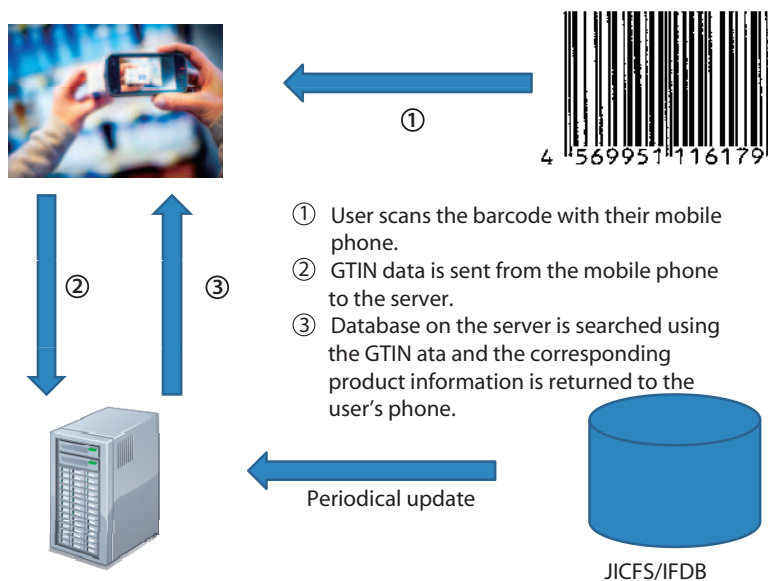
So it was not easy for users to find products using product name as a search key from the database that contains enormous products information. Therefore the company decided to prepare a more user-friendly interface that allows users to search by scanning the barcode printed on a product.

In order to do so the company mapped the database and JICFS/IFDB using product names and added GTIN to the database.

For those 20,000 items where product names did not match, the company decided to keep product names as they were so as to avoid confusion among current users who are already familiar to using product name as a search key.

The enterprise uses JICFS/IFDB to periodically update and add product information. At present, when adding or updating data in the product information database, the enterprise uses the existing JICFS/IFDB product name as is.

Fig. 5.1.1-1 check the calorie counts of packaged foods



5.2 RDS (Ryutsu POS Database Service)

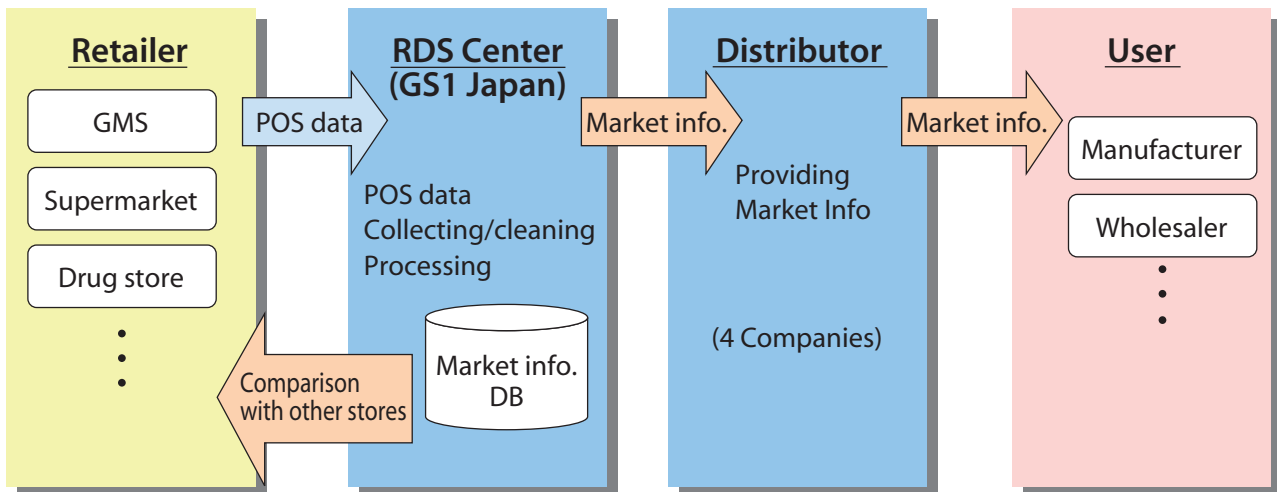
RDS is a POS(Point of sale) database service run by GS1 Japan, collecting POS data from retailers and give them feedback and to distribute analyzed data to wholesalers and manufactures. It is now an infrastructure for market research or retail support available at low cost. The users are retail and wholesale industries as well as local and small-scale manufacturers (see Fig. 5.2-1 for RDS System for data collection and ↗

distribution scheme).

Retailers that participate in RDS and regularly provide POS data can use the Web-based POS Data Analysis Service without charge. Retailers only need an PC connected the Internet to use the service, and even small-scale retailers can easily compare and analyze their own POS data with data from other retailers in the region. See 5.2.2 for detailed case examples.

The word RDS stands for Ryutsu POS Database Service, and the Japanese language term "Ryutsu" collectively refers here to manufacturers, wholesalers and

Fig. 5.2-1 RDS system



retailers. In the first pilot of the development and operation of the RDS we conducted in 1985, when POS systems were just coming into use in Japan, aiming at establishing market research services through the use of POS data.

5.2.1 Enhanced function and extended use of RDS

For its member retailers, RDS used to provide data in a file format that compared members' product prices and sales volumes with those of other stores. In 2005, RDS was upgraded to the Web-based POS Data Analysis Service, which offers the results of POS data analysis via the Internet. The primary feature of the service is that anyone can easily compare and analyze one's own POS data (sales status) with data from other stores (store names undisclosed). This function allows users to readily find missing items in product lines or pricing errors, which their individual POS data would not reveal (see Fig. 5.2.2-1).

The information can be also utilized as effective tools by wholesalers to provide retailers with well-developed support, such as proposals for selection of product lines targeted to market trends, and by product manufacturers for product development as well as planning and reviewing sales strategies. Additionally, RDS data has recently been used by some Japanese universities as basic data for economic analysis.

Web-based POS Data Analysis Service case example—Owners and store managers of small-scale retailers can easily utilize POS data

Since the Web-based POS Data Analysis Service enables user retailers to easily compare their own POS data with data from other stores, users have increased including small-scale retailers that may have a difficulty in utilizing POS data. The system generates several kinds of analysis reports including the Store

Evaluation Report (in what product category the retailer is less competitive in the region), The Opportunity Loss Elimination Report (what is selling well in the region but not sold as much at the retailer). The Opportunity Loss Elimination Report is the most popular and is effective for collecting information on hot-selling products and preventing opportunity losses.

The following is the case example of a small-scale regional grocery supermarket, where a retailer, from top management down to employees utilize POS data by sharing reports from the Web-based POS Data Analysis to improve internal communication and decisions making process on selecting products.

5.2.2 Retailer's case study: Sales of snack foods increased through the use of web-based POS data analysis service

A local supermarket "A" in the Tohoku district increased its sales of snack foods by using the web-based POS data analysis service.

In the past, Store "A" had displayed snack foods in two areas in the store (standard and end). In the standard area, snack foods packaged in bags and boxes were displayed on two different shelves, while the end area was used mainly to display snack foods in bags. Boxed snack foods were not often sold in the end area.

The web-based POS data analysis service identified two problems for a sales strategy for selling snack foods packaged in boxes." First, in the sales ranking of boxed snack foods, seven products in the top ten had smaller PI amounts than those of the district. Second, the average unit price of all boxed snack foods in Store "A" was fairly higher than the RDS average. Because of this, the store management started working on a boxed snack food sales strategy, aiming for gains in snack food sales.

Fig. 5.2.2-1 Report example of web-based POS data analysis service

(Own store) - (all stores) = Positive means "Strong" and negative means "Weak".

分析期間: ○○年△月
RDS SKU数: 487
自店 SKU数 127

スナック(MD評価レポートサンプル)

JANコード	商品名称	順位	客数PI	PI金額		PI数量		自店実数		平均売価					
				自-R	RDS	自-R	RDS	金額	数量	自-R	自店	RDS	最高		
合計				7,324.6	8,344.3	-10.90	80.05	90.96	261,679	2,860	-0.2	91.5	91.7	1,097.7	
4901330502881	カルビー ポテトチップスうすしお味	1	100.0	16	362.4	346.0	-0.14	3.83	3.98	12,946	137	1.7	94.5	92.8	131.3
4901335110050	湖池屋 Mポテトチップスうすしお西	2	90.4	97	334.7	231.4	1.18	4.03	2.85	11,957	144	-3.0	83.0	86.0	120.0
4901335110012	湖池屋 ポテトチップスのり塩 Mサ	3	61.5	118	280.9	162.7	1.36	3.33	1.97	10,034	119	-3.7	84.3	88.0	131.3
4901330573041	カルビー レッツがんにサラダ 60g	4	100.0	-104	250.2	135.0	-1.33	2.07	3.40	8,940	74	8.1	120.8	112.7	152.3
4903015522858	ナビスコ チップスターうすしお 50	5	93.5	-36	246.8	282.7	-0.62	2.83	3.46	8,816	101	-6.3	87.3	92.6	113.0
4901330512361	カルビー ポテトチップスのしお 60	6	88.4	75	208.3	133.2	0.70	2.24	1.54	7,440	80	-0.2	93.0	93.2	126.0
4901330522810	カルビー ポテトチップスコンソメパン	7	100.0	-21	197.2	218.3	-0.34	2.16	2.50	7,046	77	-1.2	91.5	92.7	131.3
4901335110036	湖池屋 ポテトチップスリッチコンソメ	8	90.4	43	196.9	153.2	0.62	2.35	1.84	7,035	84	-3.7	83.8	87.5	119.0
4901940016891	黒ハト キャラメルコーン 袋 91g	9	91.6	47	193.3	141.7	0.68	2.13	1.53	6,906	76	-10.6	90.9	101.4	134.3
4902275039628	ベビースター コクまきキン 182g	10	35.7	70	155.4	84.6	0.50	1.01	0.50	5,553	36	-14.6	154.3	168.9	203.1
4901330532871	カルビー ポテトチップス開袋												97.7	131.4	

In order of own-store PI amount Best 10 is displayed in black.

<Explanation on data items>
 ◆自-R = (Own store data) - (RDS data)
 ◆PI数量 = (sales quantity) ÷ (no. of customers) × 1,000
 ◆PI amount = (sales amount) ÷ (no. of customers) × 1,000
 ◆客数PI = (no. of customers in a shop selling the item in question) ÷ (total no. of customers in the district)

Fig. 5.2.2-2 Snack-food section of Store "A" after improvement



(1) Analyzing customer management data in Store "A"

Store "A" had already introduced a loyalty card system. Prior to the performance comparison using the web-based POS data analysis service, the store management analyzed their own customer data which revealed that, among snack food buyers, the most loyal customers tended to buy snack foods both in bags and in boxes at the same time although they were displayed on different shelves.

Based on this finding, they reviewed their conventional approach of displaying only bagged snacks in the end area. The review resulted in a new sales plan. Store management decided to display snack foods

both in bags and in boxes together in the end area so that customers could pick up both package types snacks in one area.

(2) Using the web-based POS data analysis service

As a next step, they checked the web-based POS data and found that their average unit price of boxed snack foods was approximately 20% higher than the RDS average unit price in the district. Especially for the most important products with a 100% penetration rate in the district, Store "A" had the highest prices. Promptly, they took action to reduce the prices of those products to the RDS average unit price of the district.

In addition, they checked the RDS web database for new products which had not yet been sold in Store "A." Among them were some highly marketable and important products with high penetration rates in the district (approximately more than 70%) and high PI amounts (more than 200 yen). They decided to sell such products.

(3) Verifying the improvement effect

One month after this improvement in the store's snack food sales strategy, the PI amount of the main boxed snack foods rose from 492 yen to 1,840 yen, a

significant increase of approximately four times.

Also, the PI amount of snack foods overall increased from 10,980 yen to 16,345 yen, an increase of almost 1.5 times. These results confirmed the improvements achieved through the use of the web-based POS data analysis service .

GS1 Japan regularly holds information exchange meetings for retailers who are users of the web-based POS data analysis service.

Learning the success of Store "A" , another retailer started a similar approach and also increased its sales of snack foods.

*1. PI is short for purchase index and shows the number of products (product group) or sales amount purchased per 1,000 shoppers. It shows the strength of customer support for product (product group) in numerical values.

*PI amount = amount of sales per 1,000 customers who purchased in the store.

6. Approach to Industry

6.1 Supply Chain Standards Management & Promotion Council

Supply Chain Standards Management & Promotion Council was founded in April 2009 by various industry groups and businesses to help promote efficient supply chain information system in Japan's retail sector. The activities of the council include maintaining and promoting the Ryutsu BMS (see 2.1.2), which was initially developed with the support of the Ministry of Economy, Trade and Industry. At present, GS1 Japan acts as the secretariat of the council.

The Council held its inaugural General Assembly in Tokyo in April 2009. The council consists of 2 types of members - trade associations of manufacturers, distributors and retailers in the consumer goods industry as full members and IT businesses and solution providers as supporting members. As of June 2013, the council has 49 full member organizations and 193 supporting members. In 2013, the council is being operated with the following structure:

Organizational structure

(1) General Assembly

Once a year the Council holds a general assembly at which it approves the results of activities of the previous year as well as the new agenda for the next year. The officers of the council are also appointed at the general assembly for two-year terms.

(2) Executive Committee

The role of the executive committee includes making important decisions on the council's management, such as admitting new members, establishing and

abolishing working groups, and appointing working group members. In 2013, the committee is composed of representatives from 14 full member organizations.

(3) Working Groups

The Council has three working groups as follows (See Fig. 6.1-1).

1) Message Maintenance Working Group

This group maintains and manages the Ryutsu BMS messages and various guidelines. The work is done in response to requests from full members for changes or additions to the established standards. The group examines such requests, decides on the steps to be taken, revises the relevant guidelines and publishes new standards. In 2012, the group set the standard for product images (image size, resolution, filenames etc.) for online supermarket and published a guideline.

2) Technical Specification Working Group

This group maintains and manages the guidelines for network technology and information processing technology used for exchanging the standard messages of the Ryutsu BMS via communications circuits.

3) Promotion Working Group

This group examines and implements steps to encourage wider adoption of the Ryutsu BMS among SMEs. The group also monitors "off the standard usage" of Ryutsu BMS.

Activities for promotion and increasing adoption

To encourage wider use of the Ryutsu BMS, the council is doing the following activities:

1) Holding various seminars on the Ryutsu BMS The council holds introductory, implementation courses

Fig. 6.1-1 Management system of the Council (2013)

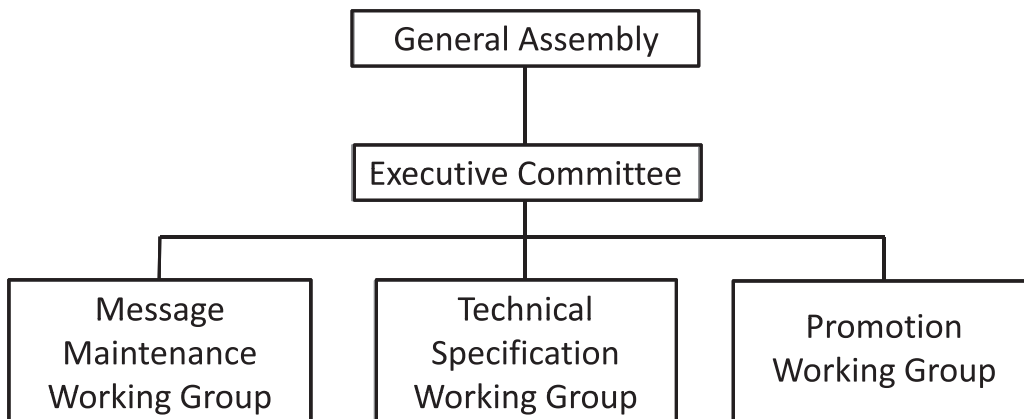


Fig. 6.1-2 Ryutsu BMS Forum & Exhibition 2012

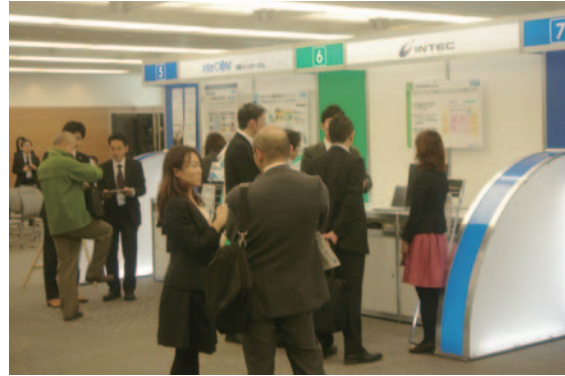


Fig. 6.1-3 Ryutsu BMS logo



on Ryutsu BMS. The council also holds half day seminars on the Ryutsu BMS at several major cities across the country. (For more details, see 8.1)

2) Holding annually Ryutsu BMS Forum & Exhibition
As in the previous year, the council held the Ryutsu BMS Forum & Exhibition in November 2012. At this event, in addition to various seminars and panel discussions, Ryutsu BMS-related products were exhibited by supporting members. Over 400 participants attended the Ryutsu BMS Forum & Exhibition 2012.

Registration of the Ryutsu BMS trademark

GS1 Japan has registered the Ryutsu BMS logo to be used for recommending products and services that comply with the Ryutsu BMS specifications. As of July 2013, there are 90 products accredited and permitted to use the logo.

6.2 GS1 Healthcare Japan

6.2.1 History : Aiming for prevention of medical errors ensuring patient safety

The healthcare industry throughout the world has been taking various steps to prevent medical errors and in-hospital infections to ensure patient safety. In addition, this global industry has recently recognized the importance of exactly identifying the types of drugs, medical devices and materials used in manu-

facturing, logistics, diagnosis and treatment, and in the collection of these products so as them to prevent errors and increase the efficiency of healthcare services. Responding to this situation, GS1 has been holding biannual international GS1 healthcare conferences with the cooperation of healthcare organizations all over the world.

In October 2008, the first GS1 Healthcare Conference in Asia took place in Tokyo, Japan. This conference featured lectures on activities for standardization by regulatory authorities and industry groups from various countries and on the pioneering initiatives of medical institutions and medical device manufacturers. Reports on the traceability management system for steel instruments adopted by Japanese medical institutions and on endoscopes developed by Japanese manufacturers were highly rated by the participants. With the recognition that this international conference held in Tokyo greatly increased interest in GS1's healthcare activities throughout the Japanese healthcare industry, GS1 Healthcare Japan was founded in May 2009.

6.2.2 Goal and members

The goal of GS1 Healthcare Japan is to achieve patient safety by preventing medical errors using GS1 Standards. Traceability in medical front as well as efficient logistics and administrative operations will be achieved through the efforts. With the close cooperation of trade associations, government offices and other organizations, GS1 Healthcare Japan hopes to contribute to the overall development of the healthcare industry by conducting various projects using product identification with barcodes, 2-D symbols and RFIDs to promote standardization and implementation. As of August 2013, GS1 Healthcare Japan has 79 corporate members, 23 individual members, 26 trade associations and 36 supporting members.

6.2.3 Activities

The main activities of GS1 Healthcare Japan are as fol-

lows:

- 1) Standardization and research activities
 - Investigating optimal product identification for medical devices and materials.
 - Investigating optimal product identification for regulated pharmaceuticals.
 - Investigating optimal means of ensuring healthcare safety at medical institutions using automatic data capturing.
- 2) Exchanging information with manufacturers, wholesalers, medical institutions and regulatory organizations
- 3) Make proposals to government agencies, utilizing the above mentioned information.

Beginning in the summer of 2009, GS1 Healthcare Japan had started holding four work group meetings. The scope of these groups was as follows:

1. AIDC Work Group: to research and discuss the utility and issues of GS1-128 for business systems in the healthcare sector.
2. RFID Work Group: to investigate optimal use of

RFID tags in the supply chain between manufacturers and wholesalers.

3. International Work Group: to draft the proposal for the International Medical Device Regulators Forum (IMDRF) public comments on Unique Device Identification (UDI)
4. Medical Device Marking Work group: to draft the guideline for marking 2D symbols on steel medical instruments

In 2013, the Work Groups are reformed into two new Work Groups explained here below;

1. International Standards & Regulations Study Work Group (201 members, Aug. 2013)
Keep watching international trends and work with MHLW to facilitate introduction of medical safety system to medical facilities.
2. Medical Solution Study Work Group (106 members, Aug. 2013)
Let medical service providers aware of importance of GS1 system for facilitating implementation parallelly with the lobbying activities.

Fig. 6.2.3-1 Governing structure

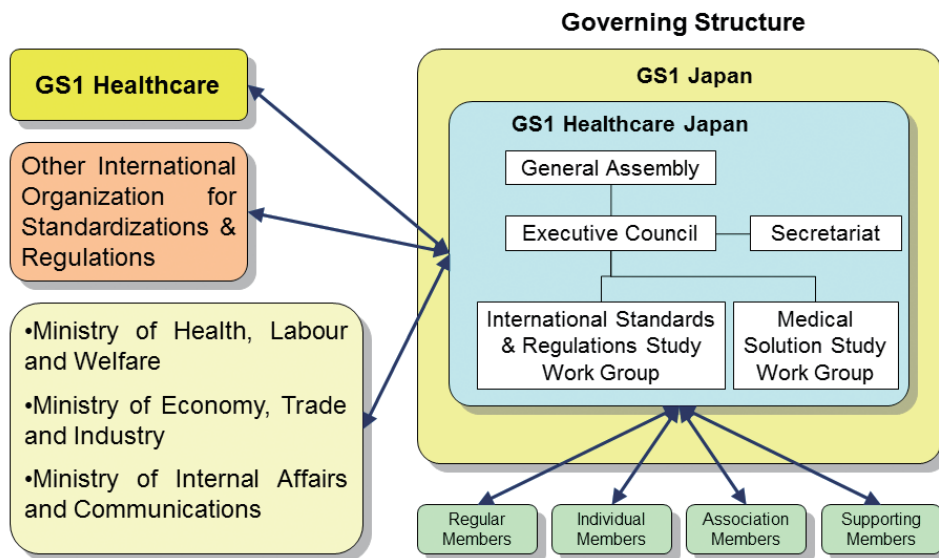


Fig. 6.2.3-2 General assembly (June, 2013)



Fig. 6.2.3-3 GS1Japan medical delegation team (Feb, 2013)



7. Study Groups

7.1 Study Group for Supply Chain Information Systems

We have a membership-based workshop engaging in systematization of distribution information promoted by GS1 Japan since 1977.

This study group holds bimonthly seminars on various subjects such as global standardization, state-of-the-art technology, implementation case studies and overseas trends. It also organizes study tours and discussion sessions. The workshop functions as an information exchange between members and GS1 Japan, as well as between the members themselves.

In FY2012, the workshop has a membership of about 63 companies including retailers, solution providers and consulting firms.

The main workshop topics are as follows:

- Ryutsu BMS best practices
- logistics information systems in the wholesale industry
- logistics information systems in the retail industry
- state-of-the-art logistics information systems by member companies
- logistics information systems in the consumer products manufacturing industry
- logistics information systems in the apparel industry
- study tours

Fig. 7.1-1 Workshop



7.2 Study Group for ICT-Oriented Wholesale Industry

In 1985, we set up a study group aimed at promoting computerization of the wholesale industry with GS1 Japan as its secretariat. In Japan's supply chain system, wholesalers play a major role as most manufactured products are delivered to retailers through wholesalers.

The study group is operated primarily by wholesalers dealing in FMCG in different industries (foods, pharmaceutical products, etc.), and its membership is currently about 40 companies.

The group is divided into several sub-working groups according to members' interests, and each hold monthly meetings. There are other activities including an annual forum, which is the biggest event, and future solution study tour.

In 2012, we will expand to specific individual subjects including "BCP/BCM in the wholesale industry," "Use of new IT technologies," and "Proposals and training for Ryutsu BMS standard operations" and discuss them to summarize recommendations of the wholesale industry.

Fig. 7.2-1 ICT-Oriented wholesale industry forum



7.3 Study Group for Information Systems in Food, Beverage, and Alcohol Industry

This study group is a voluntary group of liquor and processed food businesses established in 1983 with the aim of studying the most appropriate information systems for use between food producers and wholesalers. It is important for members to cooperate with wholesalers, as they are positioned between retailers and product manufacturers. Therefore, the study group has a system for continuous consultation with the Japan Processed Foods Wholesalers Association, a national organization of processed food wholesalers. The study group has about 70 corporate members that are representative of Japan's processed foods, marine products, and liquors businesses. GS1 Japan serves as the group's secretariat.

The study group conducts joint studies on new issues concerning standardization of B2B data exchanges among companies in the supply chain. It holds regular meetings four times a year where best practices are introduced. It also organizes seminars on the latest topics by invited outside lecturers and study tours to pioneering businesses. The group also serves as a place for gathering and summarizing the opinions of those in the industry.

7.4 The Collaborative Council of Manufacturers, Wholesalers, and Retailers

The Collaborative Council of Manufacturers, Wholesalers, and Retailers was formally established in May 2011 for the purpose of improving industrial competitiveness and contributing to an affluent standard of living for the nation's citizens through extensive innovations and improvements of supply chain management. The Council's Vision states the

objectives of the activities of this collaboration of the retail supply chain stakeholders. Member companies participate the Council based on the endorsement and support of the Vision by their executive management and agreement to act upholding the Vision. GS1 Japan and the Distribution Economics Institute of Japan jointly serve as the secretariat of the Council.

Under the auspices of both Institutes, 15 founding member companies have participated and continued to hold preparatory meetings since May 2010. They discussed the adoption of the Vision and how to manage the full-scale activities of the Council with the active support of the Ministry of Economy, Trade and Industry (METI). They also established working groups and continued discussions on three specific themes, "Reducing Returns" , "Optimizing Deliveries" , and "Promoting the Introduction of a new EDI standard known as Ryutsu BMS" . The founding companies announced the formal establishment of the Council in the "Collaborative Forum of Manufacturers, Wholesalers, and Retailers" in May 2011.

In 2012, the Council had discussed three specific themes, "Reducing Returns," "Application of the barcode system for dates and other information," and "Information sharing for supply chain optimization." The Council reported its results at the "General Meeting and Forum of the Collaborative Council of Manufacturers, Wholesalers, and Retailers" in Jul 2013. The executive management of each company will take responsibility for its own company's activities and lead specific on-site innovations and improvements within the company. The Council has a three-tier meeting structure consisting of a general meeting, steering committee, and working groups to enable the integrated promotion of management policies and on-site improvements.

In addition, the Council's management will actively strengthen its cooperation with the policies of METI and other government agencies.

Fig. 7.4-1 General meeting and forum of The Collaborative Council of Manufacturers, Wholesalers, and Retailers



8. Supporting IT Implementation at Local Shopping Streets

It is estimated that there are about 13,000 local shopping streets throughout Japan. Such shopping streets are composed mainly of small and medium retailers and service traders (SMEs). And these businesses have recently been revalued because they not only supply products and services but also support the community infrastructure by, among others, maintaining and inheriting community and traditional culture and helping to keep their towns safe. However, these SMEs have been increasingly going out of business for various reasons, and shopping streets have continued to decline since their peak in 1982.

SMEs tend to face bigger challenges to use information and communications technology (ICT) than large retailers. GS1 Japan has conducted studies and pilot programs on various ICT systems in cooperation with shopping streets and has supported ICT introduction by many SMEs since the 1990s. GS1 Japan has now expanded the subject of these studies to include new systems and local revitalization to support SMEs.

Some businesses that we have supported and studied are presented below.

8.1 Loyalty Card System

The loyalty cards issued by shopping streets mainly aim at gaining more customer loyalty to the shopping street businesses. Loyalty cards are used as tools for collecting customer data to encourage repeat purchases by giving customers points according to the purchase amount and offering them a variety of services and effective sales promotions. Recently, there have been cases in which loyalty cards have been used for community currency purposes by, for example, offering customers points for their contribution to the community or the environment.

8.2 Group Contracts for Credit Cards and Debit Cards

In shopping streets where there is much use of credit cards by purchasers, a cooperative group contract between member stores and a credit card company is very advantageous: shopping streets enjoy alternative payment options for consumers and decreased fees

for the member stores, while the credit card company benefits from simplified collection processing.

8.3 Development of Shopping Street Websites

Some shopping streets create a website and use it to provide information, mainly for sales promotion purposes. Some of them sell member stores' merchandise online, and others use customers' mobile phones as sales tools and display sales promotion coupons on the mobile phone screens.

8.4 Cooperation with Other Card Systems

Recently, shopping streets have been increasingly adding their own unique features to existing card systems instead of developing new systems. Some of them provide various services and help revitalize their local economies by cooperating with the use of IC cards that adopt a Felica contactless IC card technology managed by transportation companies*1 or IC cards managed by major retail companies and Basic Resident Registration Cards issued by local governments.

8.5 Acceptance of Electronic Money

As with credit and debit cards, shopping streets are now accepting electronic money in an effort to increase customer conveniences and gain new customers by adding this new means of payment. Electronic money is suitable for small payment amounts and has a high affinity for the above-mentioned loyalty cards and transportation IC cards. Cooperating with widely used electronic money has become very common for these cards recently.

Fig. 8-1 Shin Kyogoku street shopping district



*1 RFID HF Tag

9. User Support

9.1 Promotional and Training Activities and Consulting

GS1 Japan provides a variety of seminars intended mainly for companies that have acquired GS1 Company Prefix. The participants at these seminars include retailers and wholesalers, manufacturers, and Solution Providers. Among others, the following seminars are held regularly:

- Barcode Basics
- Introduction to EPC/RFID
- Barcoding medical device
- Introduction to Ryutsu BMS

The “Barcode basic” is an introductory seminar to promote the GS1 standard item identification code and data carriers. This seminar is regularly held in Tokyo, Osaka and other major urban areas and is well-received. The main participants include information system engineers in operating companies that have newly acquired a GS1 operator code, manufacturers, wholesalers, retailers and IT firms. Throughout 2012, more than 1,000 individuals took part in this seminar.

The “Introduction to EPC/RFID” has been regularly held mainly for beginners since 2009 to enable them understand how to optimize work processes using electronic tags. Held every two months in Tokyo or Osaka, this course explains the features of electronic tags, presents case studies on electronic tag system users, EPCglobal standards and other topics. In addition to classroom lectures, the course provides demonstrations of group reading of electronic tags for shipping and receiving inspections and hands-on

experience of electronic tag reading.

The “Barcoding medical device” started in April 2010, following the establishment of GS1 Healthcare Japan. This course explains the rule of the barcoding medical devices based on the notification issued by the Ministry of Health, Labour, and Welfare, and is for pharmaceutical companies, medical equipment manufacturers, wholesalers, hospitals, and solution providers.

The “Introduction to Ryutsu BMS” is intended for system engineers in the distribution industry, companies considering the introduction of Ryutsu BMS, and companies that support the introduction of Ryutsu BMS. Held monthly in Tokyo and quarterly in Osaka, this course covers the fundamentals of EDI, Ryutsu BMS implementation procedure, and benefits of using Ryutsu BMS etc.

In addition to the regular seminars intended for promotion and training, GS1 Japan holds various events including:

- New-Year Seminar
- EPC RFID forum
- Ryutsu BMS Forum And Expo
- Shopping Street Forum
- Mobile Seminar

These events are held every year and are open to general users.

GS1 Japan also provides consulting on the registration and use of the GS1 Company Prefix, printing of symbols, GTIN allocation rules, GLN and EPCglobal standards, standard EDI and other issues.

Fig. 9.1-1 Barcode Basics



Fig. 9.1-2 Barcode scanning experience



Fig. 9.1-3 Introduction to EPC/RFID



Fig. 9.1-4 RFID tag reading experience



9.2 Publications

GS1 Japan publishes a variety of printed publications that deal with GS1 system operations and summarize SCM-related studies in Japan to provide information to domestic retailers, wholesalers, manufacturers, and IT firms. Our currently available publications include:

- Trends in distribution information systems 2013–2014
- GS1-128 Guide–Application identifier and its use
- Barcode Fundamentals–GS1 international distribution standards for beginners
- Standard operational manual for GS1-128 and GS1 DataBar on Pharmaceutical Products

GS1 Japan has also been publishing the Distribution and System, quarterly bulletin, since 1974 and the

Distribution Development Center News bimonthly brochure since 1982. These periodicals address studies on the latest in distribution systemization such as the GS1 standards system, barcode systems, EDI, SCM, RFID (electronic tags), EPCglobal network system, and databases, as well as industry standardization, policy trends, and progress in international standardization. GS1 Japan produces video content (available on DVD) as one of its ways of providing information. This video content covers GS1 systems (including GTIN, JAN code, ITF symbol, GS1-128 barcode, GS1 DataBar, RFID electronic tags, EPCglobal network system and others) and is used in the above-mentioned seminars. DVDs containing introductory video content can be borrowed free of charge.

Fig. 9.2-1 GS1 Japan publications



10. The History of GS1 Japan

GS1 Japan was founded in 1972 mainly through the efforts of the then Ministry of International Trade and Industry (present Ministry of Economy, Trade and Industry or METI) as the Distribution System Research Institute (DSRI), a non-profit organization for promoting the introduction of distribution systems and rationalizing and increasing the efficiency of supply chains. At first, the institute conducted studies on the standardization of national product codes for apparel and grocery. Following the move towards standardized symbols as well as product codes in the U.S. and Europe, the institute started working to build a system for standardized product codes and symbols in Japan. Then in 1978, it applied for participation in EAN Association and was admitted as the first member except European countries.

In the second half of the 1970s, GS1 Japan paved a way to adopt EAN system in Japan, starting with the introduction of EAN symbols into the Japanese Industrial Standards (JIS). Source marking was tested with cooperation from Kikkoman Corporation (a soy sauce manufacturer), Coca-Cola Japan, Kai Corporation (a cutlery manufacturer), while retailers began to conduct storefront experiments with POS system.

In the 1980s, Jusco Co., Ltd. (present AEON Co., Ltd.), Co-op supermarket stores and other retailers conducted pilots on the POS system. GS1 Japan held many seminars on EAN system and POS system throughout Japan and encouraged stakeholders to adopt source marking.

The important milestone for the widespread use of source marking was the fact that, in 1982, Seven-Eleven Japan, a convenience store chain, adopted POS system at all of its stores (which totaled 1,650 at that time, but are about 12,800 at present). Another factor contributing to the diffusion of POS system was the introduction of consumption tax in 1989.

GS1 Japan created study groups for several industries in the 1980s and worked together with these industries to study how to improve their business process using computer systems. These industries included processed foods, sporting goods, consumer electronics, and books and magazines. A study group of wholesalers was also established by organizing representatives from different industries. These study groups soon came to cooperate in the adoption of EAN standards.

In addition, it is worth noting that GS1 Japan started

the service for collecting and providing POS data and began to operate the Japan Item Code File Service (JICFS), the product catalogue, as early as in the mid-1980s.

During the 1990s, GS1 Japan studied product codes, EDI messages and other subjects in cooperation with the apparel industry under METI-funded study of quick response (QR) system. Retailers used to assign their proprietary code to apparel products. Our joint study with the apparel industry led to the diffusion of EAN source marking on apparel products. It was also a landmark event when the GS1-128 was introduced for the labeling of crates containing various products delivered to department stores. The Japanese EDI messages, JEDICOS, based on the EANCOM was also completed around that time.

In the 2000s a new business model was established in Japan in which convenience stores acted as agencies for receiving public utility payments from customers. As the tool for realizing this service, the GS1-128 was adopted on the bills for the public utility charges.

And the meat industry also decided to adopt the GS1-128 for its standard labels for traceability.

The second half of 2000s was characterized by the fact that the GTIN began to be used for the online music service, an intangible product, and that Internet and mail order companies started to adopt the GTIN for their product management purposes.

During the 2003-2009 period, GS1 Japan founded EPCglobal Japan and worked to solve the problems of introducing RFIDs tags into various industries (e.g., apparel, footwear, books, consumer electronics, international distribution) by supporting METI's RFID pilot programs and thus established the basis for the diffusion of RFID.

In 2009, GS1 Healthcare Japan was established as a voluntary group for promoting GS1 Standards in healthcare sector. This move can be regarded as the outcome of our pioneering activities after the late 1990s, including our publication of guidelines for the use of the GS1 System for medical devices in cooperation with the healthcare industry.

In the area of EDI, GS1 Japan created an XML-format EDI standard (Ryutsu BMS) for supporting domestic business practices and has worked to spread the standard together with 49 trade organizations.

There have been new developments in several recent years. As public interest in food safety has increased, GS1 Japan started a joint study with Japanese super-

markets and supply chain stakeholders on the use of GS1 DataBar including pilot testing of the symbol with discounted price or sell-by-hour information at retail stores. In addition, we have begun a study on

the possibility of the service combining mobile communication with the GS1 Standards in cooperation with stakeholders in the mobile industry. DSRI celebrates its 40th anniversary in 2012.

11. Reference

11.1 Structure and Aspects of Japanese Supply Chains

Supply chains in Japan are said to have been lengthy, complicated, and low in productivity. For example, Fujiya Morishita, a leading expert in post-war studies of Japanese supply chains, described traditional supply chains in Japan as being comprised of small-scale, excessive, pre-modern, family-run businesses with low productivity in retailing, and roundabout, multi-stage systems in wholesaling.

- Recent Developments

In the past thirty years, however, supply chains in Japan have greatly changed. There are two factors involved: changes in the circumstances surrounding supply chains and changes in the supply chains themselves.

Changes in the circumstances surrounding supply chains

The following are factors related to changes in the circumstances surrounding supply chains.

First, there are changes in the industrial structure, which include the deindustrialization of Japanese manufacturers resulting from the movement offshore of secondary industries to foreign countries with lower labor costs as well as increased imports due to the stronger yen. These changes have led to the decline of competitive domestic manufacturing areas, especially in regional industries. This trend has also been accelerated by the yen's appreciation due to the Euro crisis beginning last year.

Second, there are changes in population dynamics. Japan has been experiencing a declining birthrate coupled with a population that is rapidly aging at a pace unseen in other countries. These changes in the structure and size of the population have transformed the composition of the labor force and consumption patterns.

Changes in the supply chains themselves

Next, the following are factors related to changes in the supply chains themselves.

First, there are the growth of large-scale retailers and changes in main types of business. While family-run small-scale businesses have decreased substantially, large-scale retailers have grown even larger. Moreover, while department stores and general mer-

chandise stores (GMSs) used to be the main types of retailers in the past, recently drugstores, mass merchandisers of consumer electronics, fast fashion stores and other types of retailers have enjoyed high growth. Most of these types of business have been increasing their sales through low pricing.

Second, the centers of commerce have shifted from city centers to the suburbs. Three so-called laws related to community development were enacted in 2000: the Act on the Measures by Large-Scale Retail Stores for Preservation of Living Environment (Large-Scale Retail Stores Location Law), the City Planning Act, and the Act on the Improvement and Vitalization of City Centers. These laws deregulated the opening of new stores and accelerated the construction of large-scale retail stores in the suburbs where regulations were less strict, and this in turn resulted in the decline in commerce in city centers. Therefore, the nationwide decline in city centers has come under close scrutiny as a major issue. As a result, the City Planning Act and the Act on Vitalization in City Centers were amended and the guidelines for the Large-Scale Retail Stores Location Law were revised in 2006 to regulate excessive development in the suburbs and revitalize city centers. Vitalization in city centers is once again seeing forward movement.

Recent trends according to statistics

As mentioned above, the retail sector has seen the growth of large-scale retailers and suburban stores. On the other hand, small-scale retailers located in city centers have been decreasing in the number of establishments as well as their sales. This is also shown in a large-scale survey by the Ministry of Economy, Trade and Industry (METI), which is intended to determine current developments of commerce in Japan (Census of Commerce). Although there were some revision on the laws to regulate excessive development in suburbs and to revitalize city centers in 2006, it is impossible to say that the speed of decline in commerce in city centers has been slowing down at the time of the 2007 survey,

The Census classifies commercial locations into five areas: Commerce-integrated; Office building; Residential; Industrial; and Other. Among them, the Commerce-integrated area is further broken down into five types: Around-station; City-area; Residential-background; Roadside; and Other. The term "city centers" corresponds to Around-station-type and

City-area-type under the category of Commerce-integrated area. And both of these two types of locations have experienced decrease in the number of establishments, annual sales, the number of people engaged, and sales floor spaces.

The Census also shows that establishments with one to four persons engaged have experienced decrease in their numbers and annual sales, irrespective of their

locations.

On the other hand, it shows that Roadside-type which could be described as the symbol of suburbanization as well as areas including Office-complex and Industrial, which indicate the diversification of location, have seen increase in the number of medium- to large-scale establishments and their sales.

Table 11.1-1 Recent trends

Site characteristic	2007								
	Small-scale establishments (4 or less employees)			Medium-scale establishments (5 to 49 employees)			Large-scale establishments (50 employees or more)		
	Number of establishments	Composition ratio (%)	Comparison(%)	Number of establishments	Composition ratio (%)	Comparison(%)	Number of establishments	Composition ratio (%)	Comparison(%)
Total retail trade	742,342	65.2	-10.4	379,257	33.3	-3.7	16,260	1.4	1.4
Commerce-integrated areas	278,965	65.3	-11.3	142,443	33.3	-4.5	6,055	1.4	-2.4
Station-area type	94,217	62.5	-11	54,472	36.1	-4.2	2,166	1.4	-6.3
Urban-area type	70,297	69.6	-11.4	29,618	29.3	-9.5	1,050	1	-6.3
Residential-background type	87,252	71.5	-12.9	33,213	27.2	-10.2	1,551	1.3	-4.8
Roadside type	17,682	44.2	-2.2	21,140	52.8	15.9	1,179	2.9	1.6
Other type	9,517	69.8	-14.5	4,000	29.4	-7.2	109	0.8	-16.2
Office-building areas	58,309	64.4	-4.4	31,077	34.3	-0.4	1,150	1.3	6.3
Residential areas	219,956	64.7	-11.7	114,523	33.7	-7.4	5,360	1.6	-4.1
Industrial areas	32,298	49.4	-6.4	31,208	47.7	6.6	1,932	3	18.7
Other areas	152,814	71.2	-9.7	60,006	28	-0.8	1,763	0.8	14.8

Data Source: 2007 Census of Commerce: Results by Site Characteristics, METI

Site characteristic	2007								
	Small-scale establishments (4 or less employees)			Medium-scale establishments (5 to 49 employees)			Large-scale establishments (50 or more employees)		
	Annual sales (million yen)	Composition ratio (%)	Comparison(%)	Annual sales (million yen)	Composition ratio (%)	Comparison (%)	Annual sales (million yen)	Composition ratio (%)	Comparison (%)
Total retail trade	17,926,047	100.0	-6.3	76,701,680	100.0	2.6	40,077,721	100.0	1.8
Commerce-integrated areas	6,940,388	38.7	-8.3	23,829,403	31.1	-0.8	22,369,868	55.8	-2.3
Station-area type	2,529,193	14.1	-9.1	8,587,212	11.3	-0.6	10,388,877	25.9	-3.3
Urban-area type	1,791,119	10	-5.9	4,716,860	6.1	-6.8	5,058,875	12.6	-5
Residential-background type	1,769,924	9.9	-12.2	5,659,855	7.4	-5.5	3,202,491	8	-6.9
Roadside type	650,317	3.6	2.9	4,276,518	5.6	16.1	3,453,118	8.6	12.9
Other type	199,835	1.1	-15.4	585,958	0.8	-8.6	266,507	0.7	-16.5
Office-building areas	1,483,668	8.3	0.4	6,879,811	9	7.1	3,194,384	8	21.2
Residential areas	5,039,662	28.1	-8.7	24,281,068	31.7	-0.7	8,046,872	20.1	-3.8
Industrial areas	1,104,541	6.2	2.7	9,954,410	13	15.1	3,811,199	9.5	23.1
Other areas	3,357,788	18.7	-4	11,756,987	15.3	4.5	2,655,399	6.6	11.9

Data Source: 2007 Census of Commerce: Results by Site Characteristics, METI

11.2 Statistics on Japanese Retail Industry

Table 11.2-1 Summary of the commerce statistics

Industrial Category	2004	2007	2004/2007 Growth (%)
Total No. of stores	1,613,318	1,470,995	-8.8
Wholesalers	375,269	334,240	-10.9
Retailers	1,238,049	1,136,755	-8.2
Total No. of employees	11,565,953	11,133,882	-3.7
Wholesalers	3,803,652	3,544,507	-6.8
Retailers	7,762,301	7,589,375	-2.2
Total of Annual Sales(¥Million)	538,775,810	545,250,569	1.2
Wholesalers	405,497,180	410,678,894	1.3
Retailers	133,278,631	134,571,675	1.0

The source : METI (Ministry of Economy, Trade and Industry) "The Census for Commerce" 2007

Table 11.2-2 Number of Japanese retailers and wholesalers by the number of employees

Industry	Number of employees	2004	2007	2007 Composition Ratio (%)	2004/2007 Growth (%)
Wholesale Trade	1 - 2	86,429	77,132	23.1	-10.8
	3 - 4	89,706	78,316	23.4	-12.7
	5 - 9	102,908	90,552	27.1	-12.0
	10 - 19	57,343	51,959	15.5	-9.4
	20 - 29	17,587	16,216	4.9	-7.8
	30 - 49	12,003	11,257	3.4	-6.2
	(Subtotal)	365,976	325,432	97.4	-11.1
	50 - 99	6,459	6,069	1.8	-6.0
	100-	2,834	2,739	0.8	-3.4
	(Subtotal)	9,293	8,808	2.6	-5.2
	Total	375,269	334,240	100.0	-10.9
Retail Trade	1 - 2	568,816	503,512	44.3	-11.5
	3 - 4	284,060	252,478	22.2	-11.1
	5 - 9	207,674	201,585	17.7	-2.9
	10 - 19	112,380	114,041	10.0	1.5
	20 - 29	32,696	32,301	2.8	-1.2
	30 - 49	17,477	17,208	1.5	-1.5
	(Subtotal)	1,223,103	1,121,125	98.6	-8.3
	50 - 99	10,437	10,854	1.0	4.0
	100 -	4,509	4,776	0.4	5.9
	(Subtotal)	14,946	15,630	1.4	4.6
	Total	1,238,049	1,136,755	100.0	-8.2

The source : METI (Ministry of Economy, Trade and Industry) "The Census for Commerce" 2007

Table 11.2-3 Number and sales of retail stores by type of business

Type of Stores	Total No. of stores in 2004	Total No. of stores in 2007	04/07 Growth(%)	2004 Sales ¥Million	2007 Sales ¥Million	04/07 Growth(%)
Total	1,238,049	1,137,859	-8.1	133,278,631	134,705,448	1.1
Department stores	308	271	-12.0	8,002,348	7,708,768	-3.7
[1]Large Department stores	276	247	-10.5	7,668,578	7,323,980	-4.5
[2]Other Department stores	32	24	-25.0	333,770	384,789	15.3
General Supermarkets	1,675	1,585	-5.4	8,406,380	7,446,736	-11.4
[1]Large supermarkets	1,496	1,380	-7.8	7,949,605	6,947,294	-12.6
[2]Medium supermarkets	179	205	14.5	456,775	499,442	9.3
Specialty supermarkets	36,220	35,512	-2.0	24,101,939	23,796,085	-1.3
[1]Apparel	5,991	7,153	19.4	1,544,556	1,680,800	8.8
[2]Grocery	18,485	17,865	-3.4	17,046,994	17,106,265	0.3
[3]Homefurnishing	11,744	10,494	-10.6	5,510,389	5,009,020	-9.1
Convenience Stores	42,738	43,684	2.2	6,922,202	7,006,872	1.2
Drugstore	13,095	12,701	-3.0	2,587,834	3,012,637	16.4
Other supermarkets	56,211	55,615	-1.1	5,480,581	5,949,303	8.6
Specialty stores	726,825	694,578	-4.4	49,970,253	53,929,117	7.9
[1]Apparel stores	95,497	94,954	-0.6	3,972,502	4,074,004	2.6
[2]Grocery stores	190,788	176,575	-7.4	7,023,157	7,218,837	2.8
[3]Homefurnishing stores	440,540	423,049	-4.0	38,974,594	42,636,275	9.4
Other retail stores	360,977	293,913	-18.6	27,807,094	25,855,930	-7.0

The source : METI (Ministry of Economy, Trade and Industry) "The Census for Commerce" 2007

Table 11.2-4 Top 20 wholesale companies in Japan

(As of 2011)

2011	2010	Company Name	Location of Head Office	Annual sales (¥Million)	Annual Growth(%)	Business Line
1	1	Mediceo Paltac Holdings	Tokyo	2,750,233	3.3	Drugs
2	2	Alfresa Holdings	Tokyo	2,333,256	6.9	Drugs
3	-	Mitsubishi Shokuhin	Tokyo	2,151,941	-	Grocery
4	3	Suzuken	Aichi	1,859,917	6.2	Drugs
5	5	Nippon Access	Tokyo	1,581,952	11.6	Grocery
6	4	Kokubu	Tokyo	1,471,384	2.1	Grocery
7	6	Toho Holdings	Tokyo	1,108,089	4.6	Drugs
8	7	Nihon Shuppan Hanbai	Tokyo	714,960	-2.2	Books/Audio/Video/Music Instruments
9	8	Kato Sangyo	Hyogo	702,411	5.5	Grocery
10	9	Arata	Chiba	620,751	3.1	Sundry Goods/Medical Supplies
11	-	Itochu Shokuhin	Osaka	605,470	-	Grocery
12	10	Mitsui Foods	Tokyo	603,572	10.2	Grocery
13	11	Vital KSK Holdings	Tokyo	541,650	1.8	Drugs
14	12	Tohan	Tokyo	514,543	-2.8	Books/Audio/Video/Music Instruments
15	13	Nihon Shurui Hanbai	Tokyo	492,976	1.8	Grocery
16	14	Forest Holdings	Oita	414,842	3.9	Drugs
17	15	Asahi Shokuhin	Kochi	377,313	2.0	Grocery
18	16	World	Hyogo	329,894	8.0	Textile
19	17	YAMAE HISANO	Fukuoka	298,418	8.2	Grocery
20	18	Starzen	Tokyo	259,399	-1.3	Grocery

The source : The Nikkei Marketing Journal

Table 11.2-5 Top 20 retail companies in Japan

(As of 2011)

2011	2010	Company Name	Type of business	Location of Head office	Annual sales (¥Million)	Growth (%)
1	2	Aeon	Holding Co.	Chiba	5,206,131	2.1
2	1	Seven & I Holdings	Holding Co.	Tokyo	4,786,344	-6.5
*	*	Aeon Retail	Supermarket	Chiba	2,199,000	28.5
3	3	Yamada Denki	Specialty store	Gunma	1,835,454	-14.8
*	*	Ito-Yokado	Supermarket	Tokyo	1,361,060	-0.9
4	4	Isetan Mitsukoshi Holdings	Holding Co.	Tokyo	1,239,921	1.6
5	5	Uny	Supermarket	Aichi	1,079,150	-3.0
6	6	J. Front Retailing	Holding Co.	Tokyo	941,415	-0.9
7	7	Daiei	Supermarket	Tokyo	869,494	-4.6
8	9	Takashimaya	Department store	Osaka	858,123	-1.3
*	*	Sogo · Seibu	Department store	Tokyo	831,340	-1.9
9	10	Fast Retailing	Holding Co.	Yamaguchi	820,349	0.7
10	8	edion	Specialty store	Osaka	759,025	-15.8
11	11	K's Holdings	Specialty store	Ibaraki	726,015	-5.8
12	12	Yodobashi-Camera	Specialty store	Tokyo	671,479	-4.1
*	*	Daimaru Matsuzakaya Department Stores	Department store	Tokyo	643,530	0.8
		Mitsukoshi Isetan	Department store		637,826	-
13	13	Bic Camera	Specialty store	Tokyo	612,114	0.6
*	*	UNICLO	Specialty store	Yamaguchi	600,148	-2.4
*	*	7-11 Japan	Convenience Store	Tokyo	576,186	4.9
14	14	Izumi	Supermarket	Hiroshima	515,874	2.7
15	15	Don Quijote	Specialty store	Tokyo	507,661	4.1
16	17	H2O Retailing	Holding Co.	Osaka	505,588	8.7
17	16	Life Corporation	Supermarket	Osaka	503,106	4.6
18	19	Lawson	Convenience Store	Tokyo	478,957	8.5
19	20	SHIMAMURA	Specialty store	Saitama	467,362	6.0
20	23	DCM Holdings	Holding Co.	Saitama	441,906	4.6

An asterisk (*) indicates a consolidated subsidiary whose parent company is included in the top 500 list.

The source : The Nikkei Marketing Journal

Table 11.2-6 Top 10 convenience store chains in Japan

(As of 2011)

2011	2010	Company Name	Location of Head Office	Group	Annual sales (¥Million)	No. of stores
1	1	Seven-Eleven Japan	Tokyo	Seven & I Holdings	3,280,512	14,005
2	2	Lawson	Tokyo	Mitsubishi Corporation	1,825,809	10,310
3	3	Family Mart	Tokyo	Itochu Group	1,661,179	8,834
4	4	Circle K Sankus	Tokyo	Uny	1,097,915	6,299
5	5	Ministop	Chiba	Aeon	355,525	2,046
6	6	Daily Yamazaki	Chiba	Yamazaki Baking	229,294	1,648
7	7	Seicomart	Hokkaido	Independent	181,987	1,134
8	8	Three F	Kanagawa	Independent	106,355	639
9	9	Poplar	Hiroshima	Independent	92,432	700
10	10	JR East Retail Net	Tokyo	East Japan Railway Company	87,004	468

The source : The Nikkei Marketing Journal

Table 11.2-7 Sales by type of merchandise in department stores (As of 2012)

	Total sales (¥Million)	%
Total sales	6,145,621	100.0%
Apparel	2,132,276	34.7%
Accessories	758,014	12.3%
Household goods	299,978	4.9%
Grocery	1,738,651	28.3%
Restaurant	177,198	2.9%
Sundry goods	850,767	13.8%
Service	67,103	1.1%
Others	121,334	2.0%
(Shopping gift cards) *	(210,266)	-

(*The sales of shopping gift cards are not included in the total sales.)

The source : Japan Department Stores Association

Table 11.2-8 Sales by type of merchandise in chain stores (As of 2012)

	Total sales (¥Million)	%
Total sales	1,044,655	100.0%
Grocery	645,699	61.8%
Apparel	109,814	10.5%
Sundry goods	84,465	8.1%
Drugs & Cosmetics	36,653	3.5%
Furniture & Homefurnishing	41,127	3.9%
Home electrical apparatus	11,310	1.1%
Other living goods	38,623	3.7%
Service	3,267	0.3%
Others	73,697	7.1%

The source : Japan Chain Stores Association (57 member companies and 7,947 stores)

Table 11.2-9 The growth of e-commerce market in Japan (As of 2012)

		2009		2010		2011		
		Scale (¥Billion)	EC ratio	Scale (¥Billion)	EC ratio	Scale (¥Billion)	y/y	EC ratio
Retail	GMS	1,429	3.60%	1,611	4.18%	1,782	110.6%	4.74%
	Apparel & Accessories	86	0.70%	112	0.88%	144	128.6%	1.12%
	Grocery	377	0.62%	436	0.71%	532	122.0%	0.85%
	Automobile, Automobile Parts	946	2.81%	1,222	3.47%	1,246	102.0%	4.08%
	Furniture, Household goods							
	Electrical products							
	Drugs & Cosmetics	225	2.14%	312	2.85%	420	134.6%	3.64%
Sporting goods, Books, Music, Toys	297	1.78%	333	2.14%	367	110.2%	2.46%	
Service	Tourism	909	4.13%	1,101	4.65%	1,270	115.3%	5.47%
	Restaurants							
	Entertainment	106	0.74%	126	0.81%	131	104.0%	0.89%
Construction		N/A	N/A	N/A	N/A	N/A	N/A	
Manufacturing		159	N/A	138	N/A	119	86.2%	N/A
ICT		1,757	N/A	1,989	N/A	2,032	102.2%	N/A
Transport & Logistics		265	N/A	266	N/A	264	99.2%	N/A
Financial Services		80	N/A	71	N/A	72	101.4%	N/A
Wholesalers		60	N/A	71	N/A	80	112.7%	N/A
Other								
Total		6,696	N/A	7,788	N/A	8,459	108.6%	N/A
Total(Retail and Service)		4,375	2.08%	5,253	2.46%	5,892	112.2%	2.83%

The source : METI (Ministry of Economy, Trade and Industry) "FY 2011 Research on Infrastructure Development in Japan's Information-based Economy Society (E-Commerce Market Survey)"

The source : The Nikkei Marketing Journal
The EC ratio in this survey refers to the ratio of the e-commerce market scale against the total amount of the overall commercial transactions.

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